PERSISTENCE TO OVERCOME BARRIERS TO WALKING FOR ACTIVE TRANSPORTATION: AN EXPERIMENTAL STUDY OF UNIVERSITY STUDENTS WHO DIFFER IN SELF-REGULATORY EFFICACY

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ABSTRACT

Walking for active transportation (AT) has been associated with individuals meeting the recommended physical activity levels. Global and local (i.e., Saskatoon) reported walking rates are low. Barriers perceived as a challenge (i.e., frequent and limiting) may influence walking. Individual differences, such as self-regulatory efficacy (SRE), may help people persist in overcoming challenging barriers, with those being more efficacious having greater persistence than their lower efficacy counterparts**.** The overall purpose of the present self-efficacy theory-based study was to examine whether individuals with higher and lower SRE differed in their persistence to overcome barriers to walking to/from a university campus under two experimental conditions (i.e., higher versus lower challenge). The experimental study design was a two (between: higher versus lower SRE to overcome barriers) by two (within: higher versus lower challenge vignette) mixed factorial, with three measures of persistence as the dependent variables (i.e., number of written solutions to overcoming barriers, time taken to record the solutions, and anticipatory perseverance to overcome barriers to walking in the near future). Based on self-efficacy theory and past research, individuals who had higher SRE were expected to have significantly higher persistence than their lower SRE counterparts after reading the higher challenge vignette. Participants were young adults who walked to/from a university campus. Higher and lower SRE groups were identified via a median split (n_{higher} = 22; n_{lower} = 23). Each participant read a higher and lower challenge vignette (i.e., order counterbalanced across participants) in a lab-based setting, followed by completion of persistence measures after each vignette reading. Findings from a series of two by two ANOVAS provided partial support of the study hypothesis. A significant interaction between SRE groups and challenge vignettes was found with the persistence measure of time spent reporting coping solutions, $F(1,43) = 4.64$,

$p = .037$. As expected, results from simple main effects showed the higher SRE group significantly differed from the lower SRE group under the higher challenge vignette condition, $F(1,43) = 5.27$, $p = .027$, by spending significantly more time reporting solutions. No other significant interactions were found between SRE groups x vignettes with the remaining measures of persistence: (1) number of reported solutions $F(1,43) = 3.15$, $p = .083$, and (2) anticipatory perseverance $F(1,43) = 0.05$, $p = .82$. The present study contributed new information on challenging barriers to walking for AT. Findings from the experiment partially supported contentions from self-efficacy theory about the importance of SRE beliefs to persistence when individuals are challenged. Future research should continue to examine the potential role that SRE beliefs play in whether individuals walk for AT.

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CHAPTER 1
INTRODUCTION

Active transportation (AT) refers to any mode of human powered transportation, such as cycling, wheelchair use, in-line skating, skateboarding, and walking, with the latter being one of the most common modes (Gordon-Larson, Boone-Heinonen, Sidney, Sternfeld, Jacobs, & Lewis, 2009; Shephard, 2008; Shields & Tjepkema, 2006; Vuori, Oja, & Peronen, 1994). Walking for AT is associated with individuals meeting the recommended physical activity levels for health (Buehler, Pucher, Merom, & Bauman, 2011; Carver, Timperio, Hesketh, Ridgers, Salmon, & Crawford, 2011). Examples of health benefits from walking for AT include increases in high-density lipoprotein levels and oxygen utilization, protective effects against cardiovascular events, reduced risk of type 2 diabetes, and decreased incidences of depression (Bassett, Pucher, Beuhler, Thompson, & Crouter, 2008; Genter, Donovan, & Petrenas, 2008; Hamer & Chida, 2008; Oja, Vuori & Peronen, 1998; Pucher, Buehler, Bassett, & Dannenberg, 2010; Reynolds, Winters, Ries & Gouge, 2010; Sato, Hayashi, Kamee, Nakamura, Harita, Endo, & Yoneda, 2007).

1.1 Active Transportation Rates and Intention

Despite the health benefits associated with walking for AT (hereafter referred to as walking), globally reported participation rates are low showing that less than one quarter of individuals engage in this motivated behavior (e.g., Gerrard, 2009; Panter, Griffin, Jones, Mackett, & Ogilvie, 2011; Shields & Tjepkema, 2006; Vuori et al., 1994). For example, the 2006 Canadian census illustrated that only 7% of Canadians walked to work (Shields & Tjepkema, 2006). In Saskatoon, the number of people who walked to work in that same year was slightly lower than the Canadian national average at 6.4%.

One explanation for the low rates of walking reported in the literature may be the inclusion of participants who had to walk over unreasonably long distances. For example, the Canadian census data were derived from a representative sample of individuals who lived both near to and far away from their work (Shields & Tjepkema, 2006). Examining rates of walking within more realistic, shorter distances may reveal higher rates of participation. Rafferty and colleagues (2004) found that among an adult sample who travelled to work, 72% of the sample travelled over a short distance (i.e., .25 – 1.00 mile). Of these participants, 63% never walked whereas 22% walked an average of three or more times per week. Another study found that when people travelled distances under a mile, 79% of the trips were made via walking. However, when the distance travelled increased to include trips made between one and two miles, the percent of walking trips dramatically decreased to 32%. Likewise, when the distance increased to between two and five miles, only 5% of trips were made walking (Department of Transport, 2009). Findings illustrate that although participation rates are somewhat higher when people walk shorter distances, rates are still low.

In addition to rates of walking, individuals' intentions, or willingness to engage in AT, have been examined. Vuori and colleagues (1994) assessed intention to increase current AT through walking or cycling. Sixteen percent of people who did not commute by walking or cycling were willing to begin AT and another 16%, who already walked or cycled, were willing to increase their trip frequency. Go for Green (1998) also examined willingness to walk and reported that under ideal conditions, 82% of the national sample was willing to walk more as a mode of transportation, whereas 78% in Saskatchewan were willing to increase their walking frequency.

1.2 Self-efficacy Theory

Although Canadians express intentions to engage in walking, actual behavior is minimal. Many reasons have been offered for why this has been the case (e.g., city density, restrictions on car use, and weather; Bassett et al., 2008; Cervero, 2002; Lumsdon & Mitchell, 1999). Social cognitions have been suggested as one possible correlate of the motivation to engage (or not) in walking (Fuller, Gyurcsik, Spink, & Brawley, 2012; Gerrard, 2009; Lumsdon & Mitchell, 1999). Investigations of social cognitions should employ a practical, theory-based perspective, which serves to guide the study methodology (Baranowski, Anderson, & Carmack, 1998; Brawley, 1993; Painter, Sales, Pazol, Grimes, Wingood, & DiClemente, 2010). According to Brawley (1993), a practical theory: (a) focuses on social processes susceptible to change, (b) describes the relationships between variables, (c) has a set of assessments for the variables, (d) has a substantive research base (i.e., basic and applied), (e) offers ways in which the concepts can be translated into operational manipulations, and (f) provides a basis for explaining why manipulations did or did not produce change. Self-efficacy theory meets these criteria and guided the present research (Bandura, 1997).

Self-efficacy is conceptually defined as individuals' confidence in their skills and abilities "to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). Self-efficacy beliefs are key to the regular performance of motivated behaviors, including walking, because they influence the degree of effort and persistence put forth in overcoming challenges to behavioral performance. Among individuals who have the physical capabilities to walk, efficacy beliefs to perform the task (i.e., walking) would be less likely to be associated with actual walking behavior (Bandura, 1997) while previous walking behavior would have a more likely association (Weinstein, 2008). For these individuals,

walking does not pose a challenge; rather, what may be important to whether they regularly walk is their efficacy to self-regulate or manage the various day-to-day obstacles that arise and challenge their adherence, which is termed self-regulatory efficacy beliefs (SRE; Bandura, 1997). Such challenges may involve the management of when, how, with whom, and under what environmental conditions that walking must occur. Examples of challenges may include a usual walking mate being sick, a snowstorm, or a busy daily schedule.

SRE involves individuals' confidence in their skills and abilities to perform various self-regulatory tasks that are important for reaching a desired attainment (Bandura, 1986, 1991, 1997). Self-regulatory tasks may include, but are not limited to, goal setting, self-monitoring, scheduling and planning, and problem solving in order to overcome barriers to a motivated behavior. According to self-efficacy theory, individuals who have high SRE should expend more effort and persist in their self-regulatory skills when challenged (Bandura, 1997; Maddux & Gosselin, 2005). These individuals remain task-diagnostic in their search for solutions to a challenge in order to reach their desired attainment. In contrast, individuals with lower SRE will give up more easily when facing challenges, lacking persistence to achieve their desired attainment. In regard to walking, perceived barriers should be of sufficient limitation and perceived frequency that individuals differing in SRE exhibit the predicted response toward persistence (e.g., Ahlport, Linnan, Vaughn, Evenson, & Ward, 2008; Crone, 2007; Gerrard, 2009; Giles-Corti, 2006).

1.3 Perceived Barriers as a Challenge to AT

Perceived barriers can be personal and situational factors that partially or fully hinder participation in motivated behaviors (Bandura, 2004; Brawley, Martin, & Gyurcsik, 1998; Brittain, Gyurcsik, McElroy, & Hillard, 2011; Gyurcsik, Brawley, Spink, Brittain, Fuller, &

Chad, 2009). In a cross-sectional study of university students, Cole and colleagues (2008) identified eight barriers to AT through an open-ended questionnaire, which included distance, inconvenience, time constraints, preferred other method, safety, environment, infrastructure, and lack of motivation. Fuller et al. (2012) found that the most frequently reported barriers to walking to a university campus were bad weather, anxiety, sickness, busy intersections, darkness, lack of sidewalks, and the option of a faster mode of travel. These data represent possible factors that may challenge individuals' walking behavior.

To advance the understanding of barriers in physical activity research, researchers have begun to move away from the identification of barriers to identifying *challenging* barriers. According to self-efficacy theory, only when barriers are challenging should they have the potential to interfere with a motivated behavior (Bandura, 1997). Furthermore, in their review of barriers to physical activity, Brawley and colleagues (1998) suggested that challenging barriers are those that occur frequently and are perceived to limit participation in the motivated behavior.

To examine this suggestion, researchers have assessed both barrier frequency and extent of limitation. Findings across studies that included adult samples have illustrated consistent relationships between the extent to which barriers limit physical activity and, although less consistent, between barrier frequency and physical activity (e.g., Bloomquist, Gyurcsik, Brawley, Spink, & Bray, 2008; Brittain et al., 2011; Brittain, Gyurcsik, & McElroy, 2008). Further, Wilson, Spink, and Priebe (2011) found that when individuals were faced with high scheduling demands, SRE predicted physical activity. In contrast, when scheduling demands were lower, not posing a challenge, SRE did not predict activity. Findings support Bandura's (1997) contention that behavior may only be predicted under conditions of increased challenge, which in the case of barriers may be reflected by higher perceived limitation and frequency. In

turn, under such conditions, SRE should be a key predictor of persistence to overcome barriers and of adherent behavior.

1.4 SRE to Overcome Barriers

Research examining physical activity participation has illustrated support for the association between SRE to overcome barriers and behavior. For example, in a prospective study, Bray (2007) showed that SRE to overcome barriers significantly predicted physical activity in a sample of young adults transitioning into their first year of university. Other studies have also illustrated this SRE belief to be consistently associated with physical activity across various adult populations (e.g., Cramp & Bray, 2009; Gyurcsik et al., 2009).

Within the walking literature, only one study has examined SRE to overcome barriers. Fuller et al. (2012) investigated the predictive relationship between social cognitions, including SRE to overcome barriers, and walking to/from a university campus. To do so, Fuller and colleagues included only participants for whom walking was possible in that all participants had to report living within a perceived walkable distance to campus. Findings revealed that SRE to overcome barriers (e.g., busy intersections, darkness, and lack of sidewalks) significantly predicted walking, such that participants who had higher SRE beliefs walked more times to/from campus. Suggestions were for future research to examine conditions under which individual differences in social cognitions, including SRE, may help people persist in adhering to walking.

1.5 Individual Differences in SRE and Persistence

Identifying whether individual differences in social cognitions (e.g., SRE) are related to persistence in overcoming barriers would contribute valuable information to walking research (Bandura, 2004; Bryan, Glynn, & Kittleson, 2011). Unique differences may exist in how people who succeed in persisting in overcoming barriers differ from their less successful counterparts.

To extend the research by Fuller and colleagues (2012), it would be instructive to examine whether people who differ in SRE also differ in their *persistence* to overcome challenging barriers, as hypothesized in self-efficacy theory (Bandura, 1997).

Although persistence has not yet been examined in AT literature, higher levels of persistence have been associated with higher levels of efficacy beliefs in the larger physical activity domain. More specifically, Jung and Brawley (2011) used an experimental study design to investigate whether mothers who had higher versus lower SRE differed in their persistence in overcoming exercise barriers. Their experiment involved the development of written vignettes to expose higher and lower SRE groups to a challenging or a less challenging situation. After reading the randomized vignette, participants' persistence was assessed via three measures. A significant interaction revealed that higher SRE participants who read the challenging vignette reported significantly more anticipatory perseverance than lower SRE participants reading the same vignette. Although superseded by this interaction, significant main effects illustrated that the higher SRE group was most persistent. They reported significantly more coping solutions and higher anticipatory perseverance than their lower SRE counterparts. No significant differences were reported for time spent listing solutions, although the means were in the expected directions (i.e., higher SRE spent more time listing). Overall, findings illustrated that people with higher SRE persisted more to overcome barriers, particularly under challenging conditions.

1.6 PURPOSE AND HYPOTHESES

The present self-efficacy theory-based study built upon the SRE and walking research conducted by Fuller and colleagues (2012), and used methods employed by Jung and Brawley (2011) to examine whether individual differences in SRE may be beneficial to people's

persistence to walk. The overall purpose of the experimental investigation was to determine whether young adults with higher or lower SRE to overcome barriers to walking to/from a university campus significantly differed in their persistence to overcome barriers after reading two different written vignettes (i.e., higher challenge versus lower challenge). A pilot study, with two phases, was conducted first in order to provide the necessary information to create the vignettes and a SRE to overcome barriers measure, as well as to conduct a manipulation check of this newly constructed material. The purposes of the pilot and experimental studies are outlined below.

1.6.1 Pilot Study

The pilot study had two purposes. The first was to identify challenging barriers (phase 1). In line with procedures outlined by Brawley and colleagues (e.g., Brawley et al., 1998; Gyurcsik et al., 2009; Jung & Brawley, 2011), the purpose was to elicit *frequently occurring* and *limiting* barriers (i.e., challenging) from participants who reported walking to/from a university campus.

The second purpose (phase 2) was to create and test two written vignettes and an SRE measure based on the elicitation results. A manipulation check of the vignettes was also conducted assessing readability, realistic nature, degree of challenge, and perception of a similar other with expertise and credibility in walking. According to Bandura (1986), the latter two characteristics should result in a persuasive message, which was a key aspect to the experimental study. The readability of the SRE measure was also examined.

1.6.2 Experiment

The study was a two (between subjects: higher versus lower SRE to overcome barriers) by two (within subjects: higher versus lower challenge vignette) mixed factorial design in which

three measures of persistence were the dependent variables (i.e., number of written solutions to overcoming barriers, time taken to record the solutions, and anticipatory perseverance to overcome barriers to walking in the near future). Based on Bandura's self-efficacy theory (1997) and past research findings (Jung & Brawley, 2011), significant interactions were expected. The higher SRE group was hypothesized to exhibit significantly more persistence in overcoming the barriers after reading the higher challenge vignette compared to the lower SRE individuals (i.e., more solutions, more time taken to record the solutions, and higher anticipatory perseverance). No other significant findings were hypothesized.

CHAPTER 2
METHODS

The procedures and results for phases 1 and 2 of the pilot study are presented next. This is followed by the methods and results of the experimental study, and then the discussion. The University of Saskatchewan Behavioural Research Ethics Board approved the study prior to commencement. Figure 2.1 presents an outline for the next number of sections, up to the experimental study results.

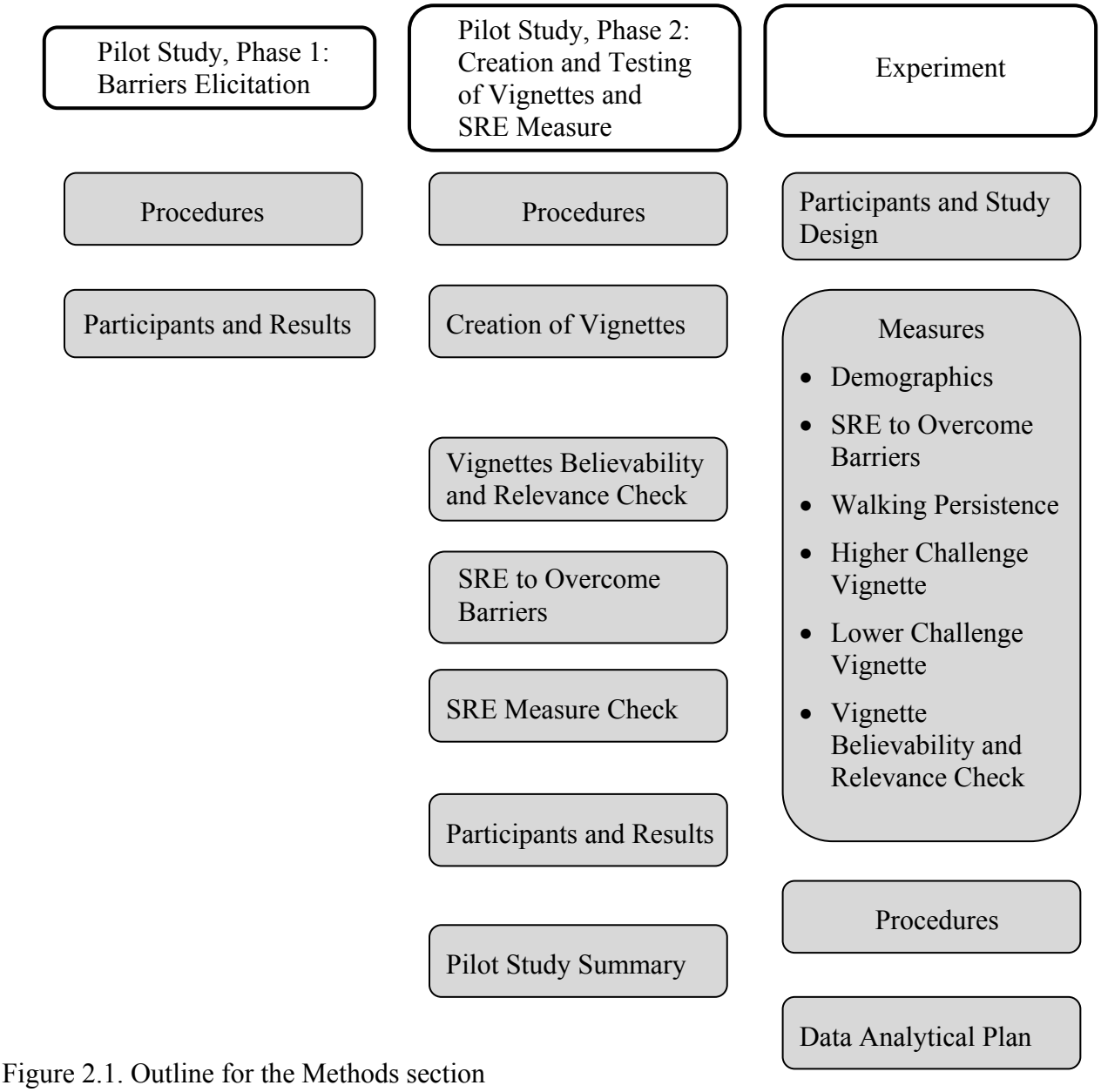

Figure 2.1. Outline for the Methods section

2.1 Pilot Study, Phase 1: Barriers Elicitation

2.1.1 Procedures. Participants were recruited from a single university campus to control for the potential variation in salient barriers to walking across different campus locations in different cities. Four recruitment strategies were used. One strategy included convenience sampling from university classes. For each class, the instructor was emailed and asked for permission to recruit at the beginning or end of the class. Recruitment occurred only in those classes where instructor permission was granted (N = 4). The other recruitment strategies included posting a message through a university-sponsored online message board, placing posters on message boards around campus, and a snowball method (see Appendix A for recruitment material). All recruitment material included a link to access the participant inclusion criteria webpage. Recruitment occurred during the months of June and July, 2011.

Interested individuals accessed the link, which began with informed consent. Individuals who did not provide consent were thanked for their interest and were asked to exit the survey. Individuals providing electronic consent continued with the survey and responded to the participant inclusion criteria questions. Both the informed consent, as well as the initial recruitment material, informed individuals that they would be contacted to participate in phases 1 and 2, both of which were going to occur in a research lab on campus.

To participate in the pilot study (i.e., phase 1 or phase 2), individuals must have met the following criteria: (a) lived within a perceived walking distance to/from the campus, (b) walked at least once either to/from campus in the past two months, (c) had plans to walk to/from campus at least once over the next month, (d) reported walking to/from campus for at least 6 months, and (e) reported at least one other mode of transportation to get to/from campus. The criterion of a history of walking was included to select participants with a longer exposure to walking; the

minimum frequency was set to walking at least once per week over the past six months, which computes to an approximate walking frequency of 24 trips over the past six months (see Appendix B for the detailed inclusion criteria survey). This was necessary because, as Bandura (1986) explains, learning from those experienced in a motivated behavior provides more accurate information (i.e., on barriers) than those who have little experience. Also, including participants who had a recent history of walking (i.e., walked at least once in the past two months) and plans to engage in walking (i.e., at least once over the next month) contributed to the veracity of the elicited barriers (Bandura, 1986). Ensuring that individuals perceived walking to/from campus was within a feasible walking distance and had at least one other mode to get to campus controlled for environmental constraints and ensured that behavior was volitional, which are paramount when studying social cognitions (Bandura, 1986; Fuller et al., 2012).

After completing the online inclusion criteria, individuals were thanked for their participation. The researcher reviewed each individual's responses to the inclusion criteria. Individuals satisfying the criteria were emailed and asked to meet in the lab in order to complete a paper survey at a mutually agreed upon time. The survey contained demographic and barriers elicitation sections. Participant demographics included information such as age, gender, registered college at the university (e.g., Kinesiology, Arts and Science, Nutrition), and self-reported height and weight, which was used to calculate body mass index (BMI). See Appendix C for the demographic survey section.

The barriers elicitation section allowed participants to respond to literature-salient barriers to walking. To begin, barriers were defined for participants "*as something that may have to do with you, personally, like not being able to find your walking shoes. Barriers can also have to do with things outside of you, like someone you normally walk with is sick*." The

definition captured the conceptualization of barriers as being both internal and external to an individual, which was necessary because it provided a more complete picture of what may challenge participants to walk (Bandura, 1986). Participants were then presented with a list of 16 barriers identified from previous AT research (e.g., Cole, Leslie, Donald, Cerin, Neller, & Owen, 2008; Forman, Kerr, Norman, Saelens, Durant, Harris, & Sallis, 2008; Fuller et al., 2012). Participants reported if they experienced each barrier in the past four weeks (i.e., *yes* or *no* response format). If participants answered "*yes*", they were asked to report the number of times within the past month that the barrier was experienced in an open-ended response format. They also reported the extent to which the barrier limited walking to/from campus, within the same time frame, on a 0 (*did not limit/stop me from walking to/from campus*) to a 10 (*completely limited/stopped me from walking to/from campus*) response scale. If a barrier was not experienced (i.e., participants answered "*no*"), participants were instructed to proceed to the next barrier item. This response structure ensured that the participants responded to personally relevant barriers only and those barriers that were not found to be salient to the sample were discarded (Brawley et al., 1998). Participants, acting as active agents in order to capture other relevant barriers (Sherif & Sherif, 1969), could list up to two additional barriers they had personally experienced in the past four weeks, listing also the frequency of occurrence and extent of limitation. See Appendix D for the barriers elicitation survey section.

Administering a paper survey in a lab setting was chosen over administering an online survey so that participants could engage in a semi-structured interview with the researcher following the barriers elicitation. The purpose of the interview was to determine if additional information on salient barriers could be obtained (see Appendix E for the interview questions). The interview was recorded using a hand-held mp3 recording device. The participants were told

that their answers would be used to help create the measures in the next portion of the study. On average, the interviews lasted five minutes.

2.1.2 Participants and Results. One hundred and three individuals completed the online inclusion criteria, with 12 participants completing pilot phase 1 or phase 2 ($n = 9$ in each phase; see Figure 2.2). All nine participants completed the barriers elicitation section of the survey while eight participants completed the demographics section. The missing demographical data were due to the researcher inadvertently not providing the demographics paper section to the participant.

As seen in Table 2.1, participants tended to be white full-time students, who were either single or living with a partner. Appendix F contains additional demographic data.

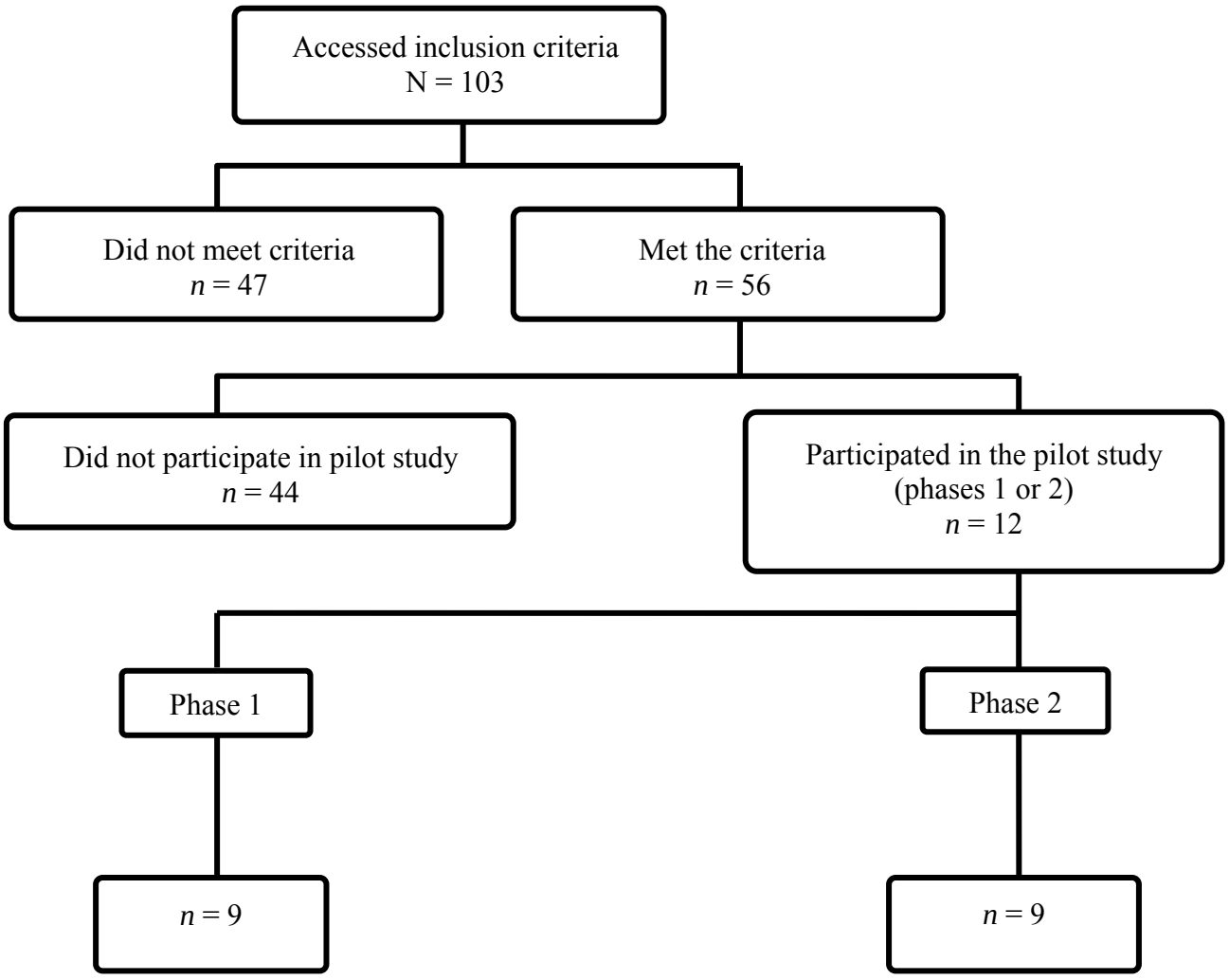

Figure 2.2. Flow chart of the pilot study participation.
Note. Six participants completed both phase 1 and phase 2. Three participants completed phase 1 only and three other participants completed phase 2 only. Individuals who did not participate in the pilot study either did not respond via email to the researcher in order to complete either phase 1 or phase 2 or were not contacted as sufficient data were obtained for the pilot study phases.

Table 2.1. Demographics for pilot phase 1

	Category	*n*
Age	22 years	1
	23 years	1
	25 years	2
	27 years	1
	28 years	1
	30 years	1
	31+ years	1
Gender	Male	4
	Female	4
College	Kinesiology	4
	Graduate Studies	3
	Arts and Sciences	1
Student status	Full-time student	7
	Not a student	1
Employment	Unemployed	3
	Part-time employed	3
	Full-time employed	2
Ethnicity	White	8
Marital status	Single	4
	Not married, living with a partner	3
	Married	1
Total household income	$10,000 - 19,999	2
	$30,000 – 39,999	2
	$40,000 – 49,999	1
	$60,000 – 69,999	2
	$80,000+	1
		M (*SD*)
BMI		24.55 kg/m2 (4.49)

Analysis of the barriers elicitation section of the survey was performed to identify salient barriers for use in the vignettes. Salient barriers were defined as: (a) occurring with a minimum average frequency of four times in the past month (i.e., once a week) (b) being limiting, which was illustrated by a mean limitation score of 5 or higher (i.e., above the midpoint of the measurement scale; Brawley et al., 1998), and (c) were reported by at least half of the participants. To be included in the vignettes, all criteria had to be met. Results showed that five barriers met these criteria: (1) had another way to campus, (2) not enough time, (3) too cold, (4) unmotivated, and (5) snowfall (see Table 2.2 for frequency and limitation scores).

The barriers elicitation section of the survey was also used to identify additional barriers to be included as SRE items. Four additional barriers were identified by over half of the participants (i.e., at least four) as having the next highest average frequency and limitation scores and included: (1) getting sweaty, (2) carrying a heavy backpack, (3) rainfall, and (4) darkness, (see Table 2.2). During the interviews, participants reiterated that their salient barriers were those identified above.

Table 2.2. Mean frequency and limitation scores of barriers reported by participants

Barrier	*n*	Frequency *M (SD)*	Limitation *M (SD)*
Items used in vignettes and SRE to overcome barriers measure			
Lack of time	8	5.88 (3.27)	5.63 (2.83)
Another way	7	11.57 (6.05)	6.00 (2.52)
Unmotivated#	6	7.00 (3.58)	3.67 (1.97)*
Too cold	5	6.50 (7.66)	7.00 (3.39)
Snowfall#	5	7.10 (8.60)	5.00 (2.92)
Additional items used on SRE to overcome barriers measure			
Sweaty	7	3.00 (2.52)	3.29 (2.43)
Heavy backpack	7	3.21 (5.21)	4.43 (3.26)
Rainfall	5	1.80 (1.79)	5.00 (3.16)
Darkness	4	2.00 (0.82)	4.00 (3.46)
Items not used:			
Distance	3	6.00 (3.50)	4.67 (1.53)
Too hot	3	1.17 (0.29)	5.00 (2.65)
Isolated path	3	1.00 (0.00)	3.67 (4.62)

Note. N = 9 participants. Other barriers (e.g., traffic, boring, illness) were reported by two, or fewer, of the participants.
*This barrier was one of several important barriers and was consistently exposed to all participants. Although a researcher error resulted in its identification for inclusion in the vignettes, the overall impact did not compromise the quality of the vignettes (see vignette believability and relevance check, Table 2.4).
#Barrier items used in the lower challenge vignette only. All five items were used in the higher challenge vignette.

2.2 Pilot Study, Phase 2: Creation and Testing of Vignettes and SRE Measure

2.2.1 Procedures. The vignettes and SRE measure were created by the researcher based upon the results from phase 1. The nine participants who participated in pilot phase 1 were asked via email to return to the lab to complete another survey (i.e., phase 2: read vignettes, complete SRE measure and respective vignette checks). Six of the nine participants responded and participated in phase 2. Three additional participants were recruited (see Figure 2.2). Recruitment strategies for the additional three were the same as in phase 1. Recruitment occurred during the months of August and September, 2011. A time was scheduled, via email, for each participant to meet the researcher in an on-campus lab. Each participant sat at a computer workstation and completed the online consent form and SRE to overcome barriers measure (see Appendices B and G), followed by the paper-based SRE check (see Appendix H).

Participants were then given a print-version of the higher or lower challenge vignette to read. Assignment of the vignettes was counterbalanced, which helped to control for any order bias that might have occurred. After reading each vignette, a paper-based vignette believability and relevance check was administered. Between completion of the first vignette check and the reading of the second vignette, a distractor task was administered in order to reduce short-term memory retention of the first vignette. The task was 40 single-function (i.e., addition, subtraction, multiplication, or division) math problems with two random numbers between -100 and 100 (see Appendix I). Participants were instructed that they had five minutes to answer as many questions as possible. This period allowed for memory decay such that as more time passes, memory recall decreases at an exponential rate (Brown, 1958; Brown, Neath, & Chater, 2007; Peterson & Peterson, 1959). Math distractor tasks have been used in past research as a strategy to reduce memory retention (e.g. Bonanno, Papa, Lalande, Westphal, & Coifman, 2004;

Bushman, 2002; Palma, Garrido, & Semin, 2011). After completing the task, the second vignette was read by the participants, followed by the vignette check again. The participants were debriefed and the researcher answered any participant questions. Participants were thanked for their participation.

2.2.2 Creation of Vignettes. Using vignettes describing two differing challenge situations, as done by Jung and Brawley (2011), provided a consistent stimulus for purposes of investigating whether individual differences in SRE to overcome barriers to walking were related to differences in persistence. A vignette is a short description of a person and/or a situation that contains precise information thought to influence the reader (Alexander & Becker, 1978). Using such methods ensures greater experimental control by allowing participants to be intentionally primed, which Hopkins and King (2010) argue is of great importance when examining a specific process (e.g. persistence to overcome barriers). Borgida and Nisbett (1977) suggest that vignettes work well because they are designed with a concrete cognitive process thought to impact or relate to participants' preexisting mental scripts based on their own experiences (e.g., persistence in overcoming barriers to walking). This process presumes that the reader will be able to personally relate to the person and/or situation described in the vignette, which can be beneficial to the control of the experiment.

A potential downside to this approach is that each person may understand and react to a vignette differently (King & Wand, 2007; Perdue & Summers, 1986; Strachan & Brawley, 2008; Strachan, Flora, Brawley, & Spink; 2011). These factors may cause the participant to over-emphasize or de-stress different parts of the vignette, changing the intent of the vignette to an unknown degree. Therefore, a discrepancy may exist between the participant's view of, and reaction to, the situation read in the vignette versus the researcher's intended use/purpose of the

vignette. To reduce this discrepancy, a manipulation check should be performed in order to determine whether participants can relate to and be persuaded (i.e., in a manner intended by the researchers) by reading the vignette in order to test the hypothesis under study. The vignette should be tested to ensure that it is readable (i.e., understood by the participant), realistic, perceived to contain a similar other who has expertise and is credible in the area under study (e.g., walking), and provokes the intended reaction (e.g., a challenging situation; Bandura, 1997; Jung & Brawley, 2011; Royne, 2008; Strachan & Brawley, 2008). Doing so helps to maximize a common understanding of the vignette across participants, adding internal validity to an experimental study (King & Wand, 2007; Royne, 2008).

In the present study, the higher and lower challenge vignettes contained two main elements. The first element was the same for both vignettes and involved the description of a typical university student who was similar in age to the participants. Doing so helped the participants see the actor as similar to themselves, which was a necessary component when attempting to persuade individuals vicariously about challenges to walking (Bandura, 1997). Also, in order to help the participant relate to the actor in the vignette, the top four reasons that participants reported for walking in phase 1 were included (i.e., health benefits, save money, enjoyment, and reduce carbon emissions; see Appendix C for the question and Appendix F for the full results). Further, when the vignettes were administered, the gender of the participant dictated the gender of the actor.

The vignettes differed in the second element, which was the number of challenging barriers described. The higher challenge vignette described an actor facing the five most salient barriers identified in phase 1 (i.e., unmotivated, too much snow, too cold, not enough time, and had another way to campus). The less challenging vignette described an actor facing the two

least limiting and frequently occurring barriers of these five barriers (i.e., too much snow and unmotivated). This kept both vignettes realistic by using salient barriers in both frequency of occurrence and limitation.

In order to keep the lower challenge vignette similar in length to the higher challenge vignette, filler content was added (i.e., words or phrases that did not add any barrier content). The higher challenge vignette was comprised of 582 words and the lower challenge vignette had 532 words. The vignettes were also similar in reading levels, as determined by the Flesh-Kincaid scale used in Microsoft Word. This scale is reliable and valid and determines reading level from the number of words per sentence and syllables per word (Burke & Greenburg, 2010). The vignettes were rated at a grade 8 (lower challenge) to 8.5 (higher challenge) reading level. See Appendix J for both higher and lower challenge vignettes.

2.2.3 Vignettes Believability and Relevance Check. The first vignette check consisted of six items: (1) if the vignette was easy to read, (2) if the experiences in the vignette were similar to the participant's own, (3) how challenging it was for the actor described in the vignette to walk to/from campus, (4) whether the actor was experienced in walking to/from campus, (5) whether the story was aimed at people like the participant, and (6) whether the story was believable. The response scale ranged from 0 (*not at all*) to 10 (*very)* (see Appendix K). Participants were also provided with space to make suggestions that might make the story more believable. After reading the second vignette, participants completed the check again, along with one additional question that asked which of the vignettes presented a higher challenge to walking to/from campus (i.e., indicating either the first vignette they read or the second).

2.2.4 SRE to Overcome Barriers. SRE to overcome barriers to walking was assessed through nine items (i.e., nine most challenging identified in phase 1, see Appendix G for the

measure; see Table 2.2 for the frequency and limitation scores). For each barrier, participants were asked: "*Will [the barrier] be a barrier to you walking to/from … campus in the next four weeks?"* For those who responded "*yes*," they reported their confidence in overcoming the barrier on a 0 (*not at all confident*) to 10 (*completely confident*) response scale. If participants answered "*no*," they were instructed to move on to the next barrier item.

2.2.5 SRE Measure Check. The SRE measure check was devised to determine if the SRE to overcome barriers measure was readable and personally relevant to the participants. The check consisted of two questions: (a) "*How easy was it to read* (i.e., the SRE measure)*?*" and (b) "*How similar were the barriers presented to those barriers that you have experienced in the past when you walked for active transportation*?" (see Appendix H). Participants answered on a 0 (*not easy at all/not very similar*) to 10 (*very easy/very similar*) response scale, respectively. Participants were then asked in an open-ended format if they had any suggestions on how to make the SRE measure easier to understand or read (see Appendix E for the questions).

2.2.6 Participants and Results. Nine participants completed pilot phase 2 (see Figure 2.2). As seen in Table 2.3, participants tended to be white, full-time Kinesiology students. Appendix F contains additional demographic data. Mean scores were calculated for the SRE measure check and the two vignette checks (see Table 2.4). The SRE check showed the measure was very easy to read ($M = 10.00$, $SD = 0.00$) and that the barriers were similar to those experienced by the participants ($M = 8.44$, $SD = 1.50$). Also, participants did not report any ways to make the SRE measure easier to read or understand.

Table 2.3. Demographics for pilot study phase 2

	Category	*n*
Age	22 years old	1
	23 years old	1
	24 years old	1
	25 years old	1
	27 years old	1
	28 years old	1
	30 years old	1
	31 + years old	2
Gender	Male	5
	Female	4
College	Kinesiology	5
	Graduate Studies	3
	Pharmacy and Nutrition	1
Student status	Full-time student	7
	Not a student	2
Employment	Part-time employed	4
	Unemployed	3
	Full-time employed	2
Ethnicity	White	8
	Black/Latin American/other	1
Marital status	Married	3
	Not married, living with a partner	3
	Single	3
Total household income	$10,000 - 19,999	1
	$30,000 – 39,999	2
	$40,000 – 49,999	1
	$50,000 – 59,999	1
	$60,000 – 69,999	2
	$80,000+	2
		M (*SD*)
BMI		22.57 kg/m2 (4.04)

Table 2.4. Vignette believability and relevance check

Item	Lower Challenge *M (SD)*	Higher Challenge *M (SD)*
1. Easy to read	9.89 (0.31)	9.67 (0.47)
2. Similar experiences	6.89 (2.33)	6.44 (3.17)
3. Challenging for actor	3.22 (1.23)*	5.89 (2.77)*
4. Actor experienced in walking	8.67 (1.41)	8.00 (2.58)
5. Aimed at people like yourself	6.44 (2.27)	6.44 (2.95)
6. Believable story	9.44 (1.07)	9.11 (0.87)

Note. The response scales ranged from a 0 (*not at all X*) to 10 (*very X*), where *X* represents the stem of the question (e.g., easy to read).

*Means significantly differed, $p < .05$.

In regard to both vignettes, results showed they were: (a) easy to read, (b) participants had similar experiences to the actors in the vignettes, (c) the actors were perceived to be experienced walkers, (d) the actors were viewed as being similar to themselves, and (e) were believable (see Table 2.4). Paired samples t-tests were conducted to determine if mean responses differed for each of these five items. It was expected that the higher challenge vignette would be rated as significantly more challenging. No other significant differences were expected. As expected, the actor in the lower challenge vignette was perceived to have a significantly lower challenge to walking than the actor in the higher challenge vignette, $t(8) = -3.08$, $p = .015$ (see item 3 in Table 2.4). No other differences were found, p's > .05. Also, eight of the nine participants reported correctly on which vignette was most challenging.

One change to the vignettes was made as a result of the open-ended responses given by the participants on how to make them more believable (see Appendix L for a detailed report of responses). Instead of having the same name for the actor presented in the vignettes as originally designed, a different name was given to the actor in the lower challenge vignette. This was done to further emphasize that the second vignette was intentionally different from the other vignette.

Some participants indicated they thought they were given the same vignette until they read through to the middle of the vignette when the vignette began describing a different barrier scenario. Appendix M has details on the changes made to each vignette.

2.2.7 Pilot Study Summary

Phase 1 resulted in the identification of salient barriers that were used in the creation of the vignettes as well as the SRE to overcome barriers measure. Results from phase 2 revealed that the SRE measure was easy to read and relevant. The vignettes were shown to be readable, believable, and relevant to the participants. The higher challenge vignette was rated as being significantly more challenging than the lower challenge vignette. Given these favorable results, the experimental study was then conducted with material that was carefully constructed, tested, and deemed appropriate for use.

2.3 Experiment

2.3.1 Participants and Study Design

A two (between subjects: higher versus lower SRE to overcome barriers) by two (within subjects: higher versus lower challenge) mixed factorial design was used in the experiment. Eighty-seven individuals accessed and completed the online inclusion criteria survey; with 24 individuals not meeting the criteria (see Figure 2.3 for participation flow chart and the procedures section for participant inclusion criteria). Forty-five of the remaining 63 individuals participated in the experiment. Eighteen individuals met the inclusion criteria but did not participate in the experiment because either they did not respond to email invitations for the experiment or they did not show up at the scheduled appointment times (despite several scheduling attempts). Participants were mainly single, white, female, full-time students with an

average BMI score falling within the normal weight range (see Table 2.5 for detailed demographics).

To determine whether individuals who met inclusion criteria, but did not participate in the study (n = 18), differed from study participants (n = 45), chi-square tests with the categorical variables (i.e., gender, ethnicity, employment status, marital status, and household income) and a t-test with the continuous variable, BMI, were conducted. Results indicated that the two groups did not significantly differ in any of the demographic variables except gender, with the lower SRE group having more females in relation to males than the higher SRE group (p's > .05).

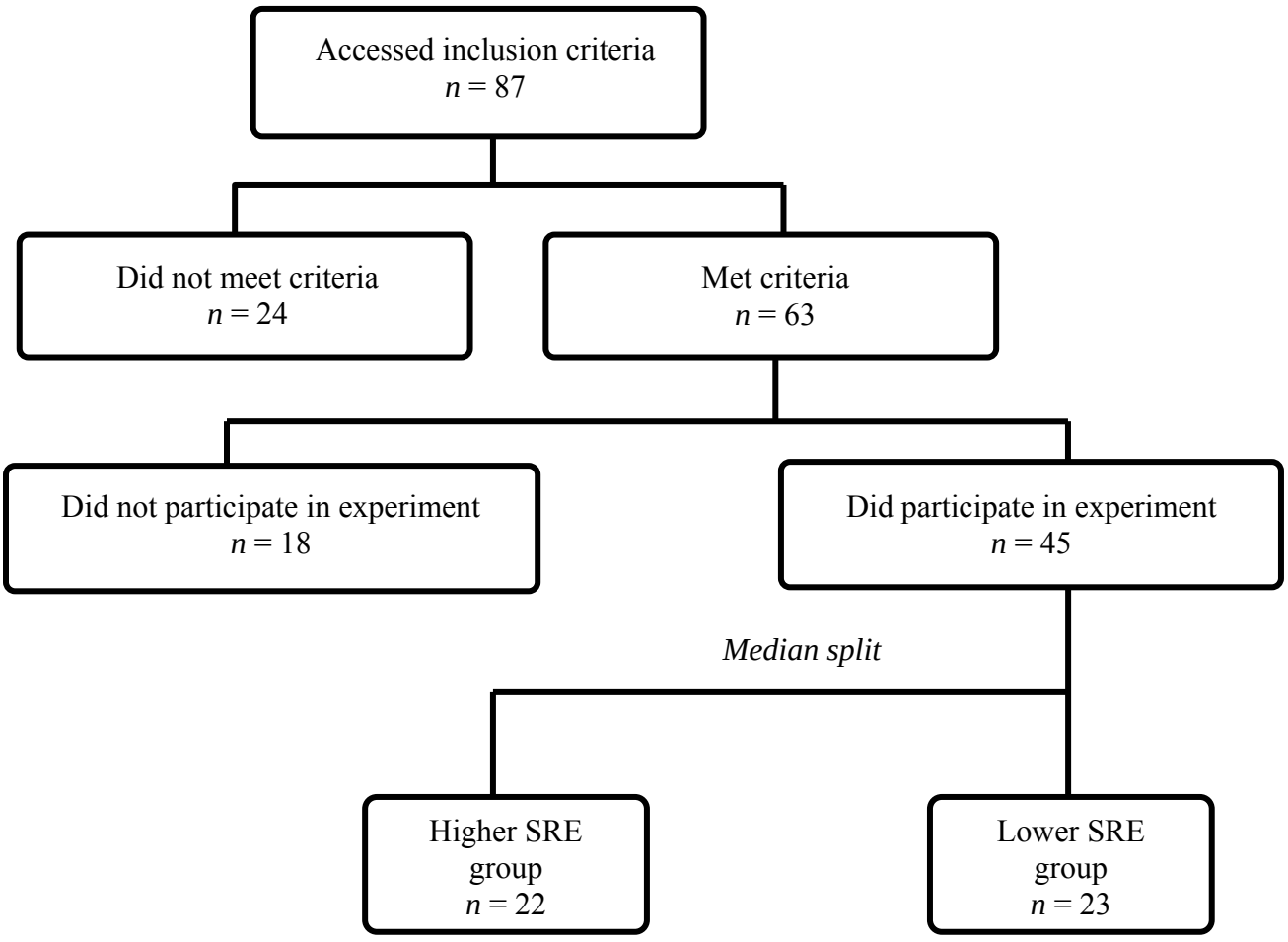

Figure 2.3. Flow chart of study participation

Table 2.5. Demographics of the experimental participants

Variable	Total	Higher SRE	Lower SRE	χ^2
	n (%)	*n* (%)	*n* (%)	*p*
Gender				0.04
Female	31 (68.9%)	12 (38.7%)	19 (61.3%)	
Male	14 (31.1%)	10 (71.4%)	4 (28.6%)	
College				0.52
Arts and Science	18 (40.0%)	9 (50.0%)	9 (50.0%)	
Kinesiology	9 (20.0%)	7 (77.8%)	2 (22.2%)	
Agriculture	6 (13.3%)	3 (50.0%)	3 (50.0%)	
Graduate studies	3 (6.7%)	1 (33.3%)	2 (66.7%)	
Engineering	2 (4.4%)	1 (50.0%)	1 (100%)	
Medicine	1 (2.2%)	0 (0%)	1 (100%)	
Commerce	1 (2.2%)	0 (0%)	1 (100%)	
Unclassified	1 (2.2%)	0 (0%)	1 (100%)	
Arts & Science; Commerce	1 (2.2%)	0 (0%)	1 (100%)	
Graduate studies; Arts and science	1 (2.2%)	0 (0%)	1 (100%)	
Graduate studies; Kinesiology	1 (2.2%)	0 (0%)	1 (100%)	
Graduate studies; Medicine	1 (2.2%)	1 (100%)	0 (0%)	
Student status				0.52
Full-time	42 (93.3%)	20 (47.6%)	22 (52.4%)	
Part-time	3 (6.7%)	2 (66.7%)	1 (33.3%)	
Employment				0.75
Part-time	25 (55.6%)	11 (44.0%)	14 (56.0%)	
Not employed	16 (35.6%)	9 (56.3%)	7 (43.8%)	
Full-time	4 (8.9%)	2 (50.0%)	2 (50.0%)	
Ethnicity				0.50
White	38 (84.4%)	20 (52.6%)	18 (47.4%)	
Southeast Asian	3 (6.7%)	1 (33.3%)	2 (66.7%)	
Canadian	1 (2.2%)	0 (0%)	1 (100%)	
East Asian	1 (2.2%)	1 (100%)	0 (0%)	
North American Indian, Metis or Inuit; White	1 (2.2%)	0 (0%)	1 (100%)	

Table 2.5 (continued)

Variable	Total	Higher SRE	Lower SRE	χ^2
	n (%)	*n* (%)	*n* (%)	*p*
Marital Status				0.23
Single	36 (80.0%)	19 (52.8%)	7 (19.4%)	
Married	5 (11.1%)	3 (60.0%)	2 (40.0%)	
Not married but living with partner	3 (6.7%)	0 (0%)	3 (100%)	
Divorced	1 (2.2%)	0 (0%)	1 (100%)	
Total household income				0.29
$0 - 9,999	13 (28.9%)	9 (69.2%)	4 (30.8%)	
$10,000 - 19,999	8 (17.8%)	4 (50.0%)	4 (50.0%)	
$20,000 - 29,999	6 (13.3%)	3 (50.0%)	3 (50.0%)	
$30,000 - 39,999	4 (8.9%)	0 (0%)	4 (100%)	
$40,000 - 49,999	6 (13.3%)	3 (50.0%)	3 (50.0%)	
$50,000 - 59,999	1 (2.2%)	0 (0%)	1(100%)	
$70,000 - 79,999	1 (2.2%)	1 (100%)	0 (0%)	
$80,000 or more	6 (13.3%)	2 (33.3%)	4 (66.7%)	
	M (*SD*)	M (*SD*)	M (*SD*)	*t*-test
BMI (kg/m^2)	23.16 (3.23)	22.94 (2.81)	23.38 (3.64)	.66

Note. Chi-square and *t*-tests were conducted to test for differences between higher and lower SRE groups on the categorical and continuous variables, respectively.

2.3.2 Measures

2.3.2.1 Demographics. Demographic information included gender, registered college within the university, employment status (e.g., part-time or full-time), self-reported height and weight (used to calculate BMI), ethnicity, marital status, and total household income (see Appendix N for the demographic questions).

2.3.2.2 SRE to Overcome Barriers. The SRE measure, developed in the pilot study, assessed participants' confidence in their skills and abilities to overcome nine barriers to walking. Participants first reported if they expected to experience each barrier in the next four weeks (i.e., "*yes*" or "*no*" response format). Participants answering "*yes"* reported their SRE to overcome the barrier in the next four weeks on a 0 (*not at all confident*) to 10 (*completely confident*) response scale. Participants answering '*no*' skipped to the next barrier item. To capture additional salient barriers (Brawley et al., 1998), participants could report up to two additional barriers and their respective SRE. A mean SRE value was calculated for each participant (see Appendix G for the SRE measure).

2.3.2.3 Walking Persistence. Persistence was assessed through three measures, similar to Jung and Brawley (2011). The first measure was the total number of coping solutions that participants reported in order to overcome the challenges to walking presented in the challenge stimulus vignette. After completing this measure, the researcher totalled the number of solutions per participant, which was then used in the analyses. The second measure was the total time taken for participants to record their solutions (i.e., as recorded by the researcher, see procedures section). The third measure was of anticipatory perseverance, which was adapted from Jung and Brawley (2011) with item wording changed to focus on walking. Participants indicated how much (1) time, (2) effort, (3) persistence, and (4) attention they would give to continue walking

to the university campus in the next seven days, under a similar situation as in the vignette they just read. The four items were assessed on a 0 (no X) to 10 (as much X as it takes) scale where 'X' represents one of the four items mentioned above (e.g., "as much time as it takes"), with an overall mean value being used in the analyses (see Appendix O for the number of solutions worksheet and the anticipatory perseverance measure). The measure was reliable in the present study (Cronbach's $\alpha = .92$).

2.3.2.4 Higher Challenge Vignette. The higher challenge vignette, developed and tested in the pilot study, was read by each participant. The vignette depicted a person (i.e., name of the person and respective pronouns in the vignette were changed to match the gender of the participant) who was experiencing barriers (i.e., the five most frequently occurring and more limiting barriers – see pilot study) to walking to his/her university campus. The vignette had 622 words and a Flesch-Kincaid reading level of grade 8 (see Appendix M for the vignette).

2.3.2.5 Lower Challenge Vignette. The lower challenge vignette, also developed and tested in the pilot study, depicted a person (i.e., similar to the higher challenge vignette, the name of the person and respective pronouns in the vignette were changed to match the gender of the participant) experiencing barriers to walking to his/her university campus (i.e., the two least frequently occurring and least limiting barriers of the five from the higher challenge vignette – see pilot study). The lower challenge vignette had 572 words and a Flesch-Kincaid reading level of grade 8 (see Appendix M for the vignette).

2.3.2.6 Vignette Believability and Relevance Check. The check consisted of six items answered on a 0 to 10 response scale, with higher scores representing more believability and relevancy of the respective vignette. For example, the first item asked participants if the story was easy to read, with the response scale being from 0 (*not easy at all*) to 10 (*very easy*).

Participants responded to the remaining five items, which asked: (1) "*To what extent were the experiences of the person in the scenario similar to their own*", (2) "*How challenging it was for the person in the scenario to walk*", (3) "*Does the person in the scenario seem to be an expert/experienced in walking*", (4) "*Was the story aimed at someone like their self*", and (5) "*How believable was the story*". There was an additional item that asked participants to indicate which of the two stories that they just read was more challenging/had more barriers to walking (see Appendix K for the measure).

2.3.3 Procedures

After receiving human ethics approval through the University's Behavioural Research Ethics Board, participants were recruited (from the same campus where the pilot study occurred) via six recruitment strategies. The first was convenience sampling from university classes. For each class, the instructor was contacted and asked for permission to recruit at the beginning or end of class. In-class recruitment occurred only in classes where instructor permission was granted (N = 4 classes). Other recruitment strategies included posting a message through a university-sponsored online message board, placing posters on message boards around campus, a snowball method, a college-wide email was distributed to all undergraduate students, and handing out flyers around campus (see Appendix P for recruitment material). All recruitment strategies included a link to access the participant inclusion criteria webpage and researcher contact information. Recruitment occurred during the months of October 2011 through February, 2012.

Interested individuals accessed the link, which began with informed consent. Individuals who did not provide consent were thanked for their interest and exited from the survey. Individuals providing consent then completed an online survey, which consisted of the

participant inclusion criteria, demographics, and the SRE measure (see Appendices N and M for the demographics measure and SRE measure, respectively). Upon survey completion, participants were thanked for their participation and notified that they may be contacted for a second portion of the study, which was to occur in an on-campus lab.

A researcher then reviewed each individual's responses to the inclusion criteria. In order to participate in the study, individuals must have met the following criteria: (a) undergraduate or graduate student at the selected university, (b) lived within a perceived walkable distance to/from the campus (i.e., to control for distance), (c) walked at least once either to or from campus in the past two months, (d) had plans to walk to or from campus at least once over the next month, and (e) reported at least one other mode of transportation to get to campus. See Appendix B for the inclusion criteria survey.

A median split of eligible participants' mean SRE scores was conducted to create two SRE groups. Two participants had the median SRE value of 6.75 and were randomly assigned to either the higher or lower SRE group. After the split, 22 individuals were placed in the higher SRE group (M_{SRE} = 8.04, SD = 1.12) and 23 in the lower SRE group (M_{SRE} = 4.59, SD = 1.62). To ensure that the experiment could proceed with groups that were empirically different in their SRE, a between-groups t-test was conducted. Results indicated that the two groups significantly differed in their SRE, $t(42) = 8.46$, $p = .025$.

Participants were individually notified via email in order to arrange a time to meet in an on-campus lab. After entering the lab, the researcher asked the participant to read a print-version of a vignette. Participants in both SRE groups read both higher and lower challenge vignettes in a counterbalanced order. After reading the first vignette, participants were presented with a paper worksheet to record their coping solutions. The participant read the coping solution

instructions, and then the researcher started an unobtrusive hand-held stopwatch to record the time taken to record solutions. The paper survey had sufficient space for the listing of up to seven solutions. The researcher made sure each participant understood they could provide more if they desired (i.e., allowing for nine more solutions on a second worksheet). Upon participant-determined completion of their solutions, the researcher discretely stopped the timer and recorded the time. Participants then completed the anticipatory perseverance measure followed by the vignette believability and relevance check. This process was repeated with the other vignette, separated by the distraction task (i.e., same as that used in the pilot study). Finally, participants were debriefed and any questions the participant had were answered. See Figure 2.4 for the full experiment flow chart.

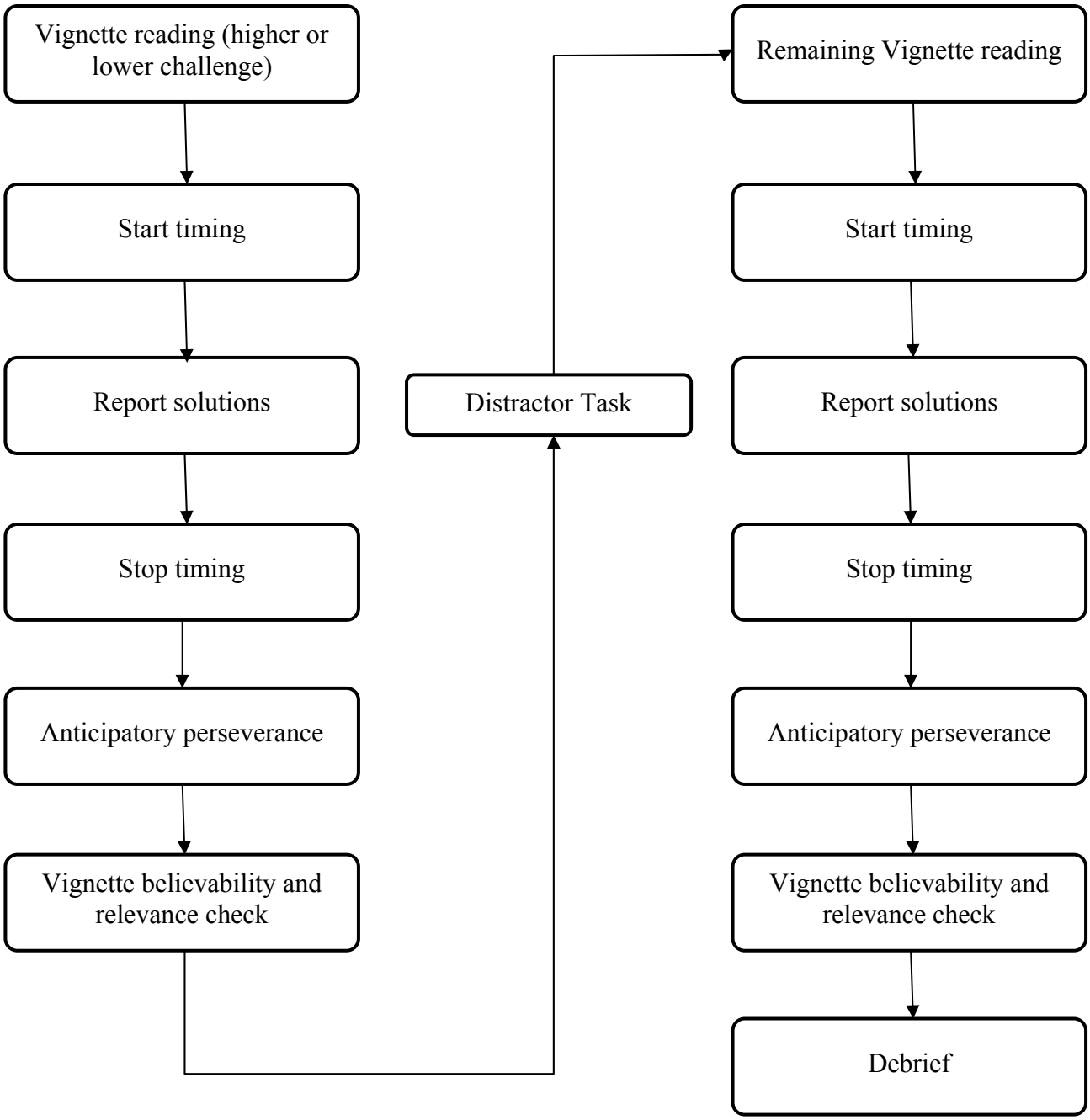

Figure 2.4. Experimental Flow Chart

2.3.4 Data Analytical Plan

The primary dependent variables (i.e., three persistence measures) were screened for missing values and normality. Additional assumptions for conducting ANOVAs were examined (e.g., homogeneity of variance). Higher and lower SRE groups were compared through chi-square and *t*-test analyses to determine whether they differed in their demographics. Any variable(s) found to differ would then be examined in the primary analyses (see next paragraph) as a covariate(s) to investigate the possibility that significant differences, if found, were due to differences in group composition (i.e., demographics). To examine whether any significant experimental effects, if found, were due to the vignette manipulation and not to differences in the believability and readability of the two vignettes, both between (higher versus lower SRE) and within groups *t*-tests were conducted on the higher and lower challenge vignette check items. Ideally, 2 x 2 repeated measures MANOVA should have been conducted but due to a lack of power (i.e., despite recruitment efforts, the low sample size contributed to the lack of power), a series of *t*-tests were conducted, without any Bonferonni adjustments of the *p* value (Nakagawa, 2004). One recognized caveat of this approach was the increased risk of committing a type 1 error. However, due to the preliminary nature of the research in the area, a decision was made to explore for potential significance with a more liberal approach.

The primary study analyses involved three, two (between subjects: higher versus lower SRE) by two (within subjects: higher versus lower challenge) mixed factorial ANOVAs to examine differences in the dependent measures of persistence (i.e., time taken to report solutions, number of solutions reported, and anticipatory perseverance). Ideally, a two by two mixed factorial MANOVA with all three persistence measures as the dependent variables should have been conducted. However, the minimum number of participants in each of the SRE groups was

required to be 30 in order to have sufficient power (i.e., 80%) to detect a medium effect (Cohen, 1988; Tabachnick & Fidell, 2012). Due to the preliminary nature of research in this area of AT and low power, a decision was made to conduct three separate ANOVAs, without Bonferonni adjustments of the *p* value, with appropriate follow-up simple effect analyses. This strategy allowed for the identification of any initial findings as being potentially meaningful and in need of future investigation with better power.

CHAPTER 3
RESULTS

3.1 Data Management

No missing data were identified. One outlier existed in the time taken to report solutions data, having a *z*-score of greater than 3.29. In accordance with Tabachnick and Fidell (2012), the data point was changed to one value greater than the next highest value in the data set. The ANOVA assumption of normal distribution was not met in two variables among the higher SRE group: (1) time taken to report solutions in the higher challenge vignette and (2) anticipatory perseverance in the lower challenge vignette (Tabachnick & Fidell, 2012). In order to normalize the skewed data, a square root transformation on time taken to report solutions and a squared transformation on anticipatory perseverance were used, based on suggestions by Tabachnick and Fidell (2007). After the transformations, homogeneity of variance was examined. Levene's tests for the three dependent variables were not significant, illustrating equality of variances (p's > .05). Independence of error terms, homogeneity of covariance, and additivity were not necessary to examine due to having only two levels of within and between subjects (Tabachnick & Fidell, 2012).

3.2 Demographic Comparisons: Higher versus Lower SRE Groups

A chi-square analysis revealed that the SRE groups significantly differed in their gender distribution, χ^2 (1, N = 45) = 4.13, p = .042 (see Table 2.5), with the higher SRE group having more males and the lower group having more females. The two groups were similar across all other categorical variables (e.g., college, income, employment; p's > .05). A t-test comparing the groups on BMI was not significant, $t(43) = .44$, $p = .66$.

3.3 Examination of Between and Within SRE Group Differences in Vignette Check

Recall that the higher and lower challenge vignettes were constructed to be similar (e.g., number of words, difficulty of reading, ability to see the actor in the vignette as an AT expert, believability), with the exception of one difference - the experimental manipulation of the degree of challenge. As previously outlined in the pilot study, vignettes should be tested to ensure that they are readable (i.e., understood by the participant), realistic, perceived to contain a similar other who has expertise and is credible, and provokes the intended reaction (e.g., a challenging situation – experimental manipulation; Bandura, 1997; Jung & Brawley, 2011; Royne, 2008; Strachan & Brawley, 2008). Doing so helps to maximize a common understanding of the vignette across participants, adding internal validity to an experimental study (King & Wand, 2007; Royne, 2008).

With this in mind, a series of between and within SRE groups *t*-tests were conducted to examine whether items in the vignette check differed. Expectations were that the higher and lower SRE groups would rate the one vignette item (i.e., item three) that concerned degree of perceived challenge as significantly higher in the higher challenge vignette versus the lower challenge vignette (i.e., a within-subjects). No other within or between SRE group differences were expected in the remaining items. The following two paragraphs summarize the between- and within-group findings in relation to these expectations.

3.3.1 Between SRE groups comparisons. Independent *t*-tests confirmed that all six higher challenge and lower challenge vignette check item means were not significantly different between the SRE groups (p's > .05; see Table 3.1 for the means).

3.3.2 Within SRE group comparisons. Within the higher SRE group, findings from dependent *t*-tests revealed that three of the six items significantly differed (see Table 3.1 for the

Table 3.1. Vignette believability and relevance check descriptives: Higher SRE group

Item	Higher Challenge Vignette	Lower Challenge Vignette
	M (SD)	*M (SD)*
1. Easy to read	8.86 (1.36)	9.23 (0.75)
2. Similar experiences	8.18 (1.56)	8.00 (1.66)
3. Perceived challenge#	4.95 (2.38)§	3.36 (2.28)§
4. Vignette actor as experienced in walking	7.18 (1.50)	6.95 (2.13)
5. Vignette aimed at someone like the reader	8.45 (1.50)§	7.23 (2.33)§
6. Believable	9.23 (0.81)§	8.82 (1.33)§

Vignette believability and relevance check descriptives: Lower SRE group

Item	Higher Challenge Vignette	Lower Challenge Vignette
	M (SD)	*M (SD)*
1. Easy to read	9.35 (1.11)	9.39 (0.89)
2. Similar experiences	8.48 (1.62)	7.91 (2.02)
3. Perceived challenge#	5.52 (2.09)*	3.04 (2.23)*
4. Vignette actor as experienced in walking	6.65 (1.85)	6.65 (2.89)
5. Vignette aimed at someone like the reader	8.43 (1.67)*	7.57 (2.13)*
6. Believable	9.39 (0.89)	9.04 (0.98)

Note. Response scale was 0 to 10, with higher scores indicative of more believability and relevancy.

= significant within group differences were expected for this item. All remaining items for both between and within SRE groups were not expected to significantly differ.

§ = Means significantly differed between higher and lower challenge vignettes within the higher SRE group ($p < .05$).

* = Means significantly differed between higher and lower challenge vignettes within the lower SRE group ($p < .05$).

means). As expected, the higher challenge vignette was rated as being significantly more challenging (i.e., item three, "*perceived challenge to walking*"), $t(21) = 2.88$, $p = .005$, compared to the lower challenge vignette. In contrast to expectations, the higher challenge vignette was rated as being significantly higher than the lower challenge vignette in item five, "*extent the story was aimed at the participant,"* $t(21) = 2.67$, $p = .007$, and item six, "*extent the story was believable,*" $t(21) = 2.25$, $p = .018$.

Within the lower SRE group, two of the six means were significantly different. Similar to the higher SRE group and, as expected, the higher challenge vignette was rated as being significantly more challenging than the lower challenge vignette (i.e., item three *"perceived challenge to walking*"), $t(22) = 4.68$, $p = .00$. Also, item five *"extent the story was aimed at the participant"* reading the story in the higher challenge vignette was significantly higher than the lower challenge vignette, $t(22) = 1.83$, $p = .046$, which was in contrast to expectations.

3.4 Summary. Findings illustrated that the higher challenge vignette had the intended effect – participants reported it as being more challenging than the lower challenge vignette. The perceived challenge item means for the higher challenge vignette were around the scale midpoint within each of the SRE groups illustrating that participants viewed this vignette as being a moderately challenging scenario (i.e., the intended effect of the experimental manipulation). The remaining significantly different means within each of the SRE groups provided no cause for concern when mean values were interpreted/considered. Across these instances, both vignettes were rated by participants as being well above the scale midpoint of five. The higher SRE group reported that both vignettes were aimed at people like themselves and were highly believable. Similarly, the lower SRE group reported that both vignettes were aimed at people like

themselves. Given that the vignettes differed in their challenge and that both vignettes were believable and relevant, the primary analyses proceeded.

3.5 Primary Analyses: Group Differences in Persistence

3.5.1 Time taken to report coping solutions. Main effects of the two (higher versus lower SRE) by two (higher versus lower challenge vignette) ANOVA with the transformed time taken to report coping solutions were nonsignificant: (1) SRE groups, $F(1,43) = 3.15$, $p = .083$, and (2) vignettes, $F(1,43) = 4.00$, $p = .052$. As hypothesized, a significant interaction between SRE groups and challenge vignettes was found, $F(1,43) = 4.64$, $p = .037$, partial eta squared = .10 with an observed power = .56 (see Table 3.2 for the means and standard deviations).[1]

Figure 3.1 illustrates the estimated marginal means for time spent reporting solutions. Graphically, the lower and higher SRE groups appear to differ in their time spent reporting solutions to the higher challenge vignette only. To further investigate the significant interaction, simple main effects were examined. Recall that based on theoretical contentions (Bandura, 1986; 1997), the study hypothesis was that the higher SRE group would spend significantly more time reporting solutions in the higher challenge vignette condition only. As such, two between SRE group simple effects analyses were conducted – comparing the SRE groups in the lower and then the higher challenge vignette conditions. No other effects were hypothesized for examination.

3.5.2 Between SRE Groups. As expected, the lower SRE group did not significantly differ from the higher SRE group under the lower challenge vignette condition, $F(1,43) = 0.59$, $p = .45$. In support of the study hypothesis, the higher SRE group significantly differed from the

[1] Due to the significant SRE group differences in gender, all of the primary analyses were conducted with gender as a covariate. Results were the same as when gender was not included in the analyses and, thus, are not presented.

lower SRE group under the higher challenge vignette condition, F (1,43) = 5.27, p = .027, by spending significantly more time reporting solutions.

Table 3.2. Persistence descriptives

Vignette	Higher SRE *M (SD)*	Lower SRE *M (SD)*
Higher Challenge		
Time (s)	334.82 (192.49)	229.43 (106.99)
Time (s), square root	*17.84 (5.36)*	*15.66 (3.42)*
Number of solutions	4.91 (1.41)	4.48 (1.24)
Anticipatory perseverance	6.70 (1.86)	6.48 (1.81)
Anticipatory perseverance, squared	*48.25 (22.99)*	*55.23 (23.78)*
Lower Challenge		
Time (s)	256.45 (106.04)	234.04 (114.22)
Time (s), square root	*14.75 (3.84)*	*14.83 (3.84)*
Number of solutions	4.23 (1.69)	4.61 (1.78)
Anticipatory perseverance	7.18 (1.96)	7.17 (1.32)
Anticipatory perseverance, squared	*45.10 (21.67)*	*53.14 (18.53)*

Note. Response scale for anticipatory perseverance was 0 to 10, with higher scores indicative of higher persistence to overcome barriers. Although the transformed time and anticipatory variables were used in the analysis, raw scores are also presented for ease of interpretation.

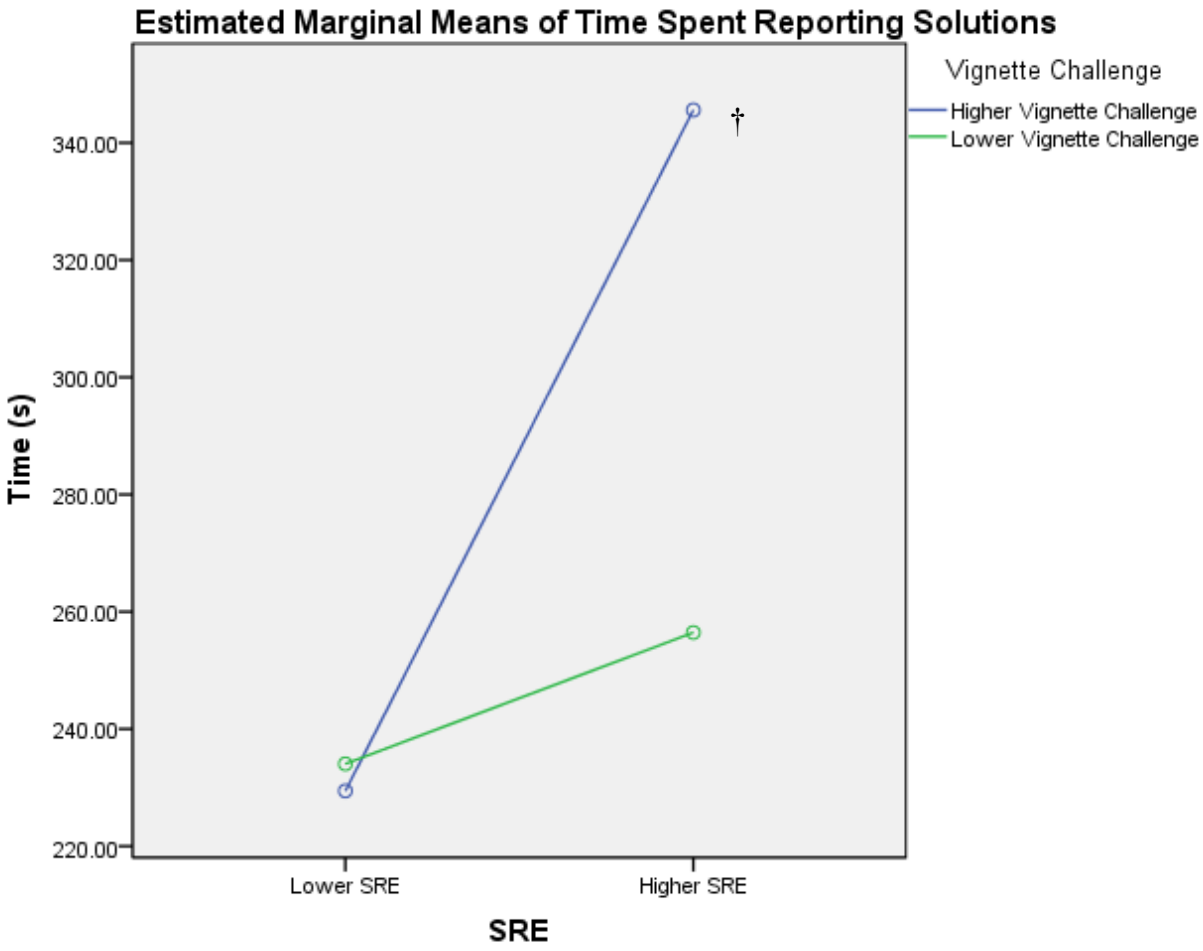

Figure 3.1. Estimated marginal means for time taken to report coping solutions.
† Between SRE groups significant difference, $p < .05$.

3.5.3 Number of reported coping solutions. Main effects of the two (higher versus lower SRE) by two (higher versus lower challenge vignette) ANOVA with time taken to report coping solutions were not significant: (1) SRE groups, $F(1,43) = .004$, $p = .95$, and (2) vignettes, $F(1,43) = 1.45$, $p = .24$. Contrary to the study hypothesis, a significant interaction between SRE groups and challenge vignettes was not found, $F(1,43) = 3.15$, $p = .083$, partial eta squared = .10 with an observed power = .41 (see Table 3.2 for the means and standard deviations). See Appendix Q for a summary of the types of coping solutions reported by SRE group. Appendix R illustrates the findings in graphical form.

3.5.4 Anticipatory perseverance. Main effects of the two (higher versus lower SRE) by two (higher versus lower challenge vignette) ANOVA with transformed anticipatory perseverance were not significant between groups: (1) SRE groups, $F(1,43) = .19$, $p = .67$, and were significant between vignettes: (2) vignettes, $F(1,43) = 10.23$, $p = .0026$. Contrary to study expectations, a significant interaction between SRE groups and challenge vignettes was not found, $F(1,43) = 0.05$, $p = .82$, partial eta squared = .00 with an observed power = .06 (see Table 3.2 for the means and standard deviations). Appendix S illustrates the findings in graphical form.

CHAPTER 4
DISCUSSION

The present research involved two studies. The pilot study was comprised of two phases: (1) Phase one: elicit challenging barriers to walking to/from a university campus and (2) Phase two: create and test two written vignettes and a SRE measure based on the elicitation results. The purpose of the experimental study was to determine whether individuals with higher or lower SRE to overcome barriers to walking to/from a university campus significantly differed in their persistence to overcome barriers after reading two different written vignettes (higher challenge versus lower challenge).

Results from the pilot study illustrated that a number of challenging barriers existed, such as lack of time, motivation, and another way/transportation method. While some of these barriers have been reported in past AT literature (e.g., Cole et al., 2008; Fuller et al., 2012; Lee, Ory, Yoon, & Forjuoh, 2012), the present study contributed new information on barriers that were *challenging* – in other words, they occurred frequently and were limiting to the study participants. Ensuring that participants perceived barriers as challenging provided strength and relevance to the stimulus material presented to participants in the experimental study. By utilizing this stimulus information, participants only responded to challenging barriers on the SRE measure, providing a more relevant measure of SRE and reducing method variance artifacts in the measure (Bandura, 1997; Brawley et al., 1998). Further, the use of challenging barriers ensured that the vignettes provided a strong and meaningful experimental manipulation (i.e., a high versus lower challenge vignette). Vignette check results from the pilot and experimental studies illustrated that a higher challenge vignette was indeed created in such a way that study participants viewed it as more challenging than the lower challenge vignette. This was key to the conduct of the experiment because Bandura (1997) contends that motivated behaviors, like AT,

may be primarily affected via persistence in self-regulatory actions under conditions of increased challenge. Under such conditions, people with higher SRE should persist to a greater extent in attempts to overcome barriers than their lower SRE counterparts. Having a higher challenge vignette allowed this theoretical contention to be tested in the experiment.

Findings from the experiment partially supported Bandura's (1997) contentions. Recall that significant differences in all three measures of persistence were expected between higher and lower SRE groups after reading the higher challenge vignette. In line with this hypothesis, ANOVA results illustrated that the higher SRE group took significantly more time to report solutions to the higher challenge vignette compared to the lower SRE group. Although the two groups did not significantly differ in the number of coping solutions and anticipatory persistence after reading the higher challenge vignette, the means were in the expected directions. That is, the higher SRE group tended to report more solutions and higher anticipatory perseverance. Regardless, possible reasons for the nonsignificant results are presented later in the discussion.

Taken together, findings support the overall trend of persistence differences found in Jung and Brawley's (2011) research on working mothers. Those who had higher SRE exhibited more persistence when overcoming challenging barrier conditions (i.e., multiple, relevant, frequent and limiting barriers). Where the present findings diverged from Jung and Brawley's was in which specific indicants of persistence differed. More specifically, higher SRE mothers in their research reported significantly more coping solutions and higher anticipatory perseverance than their lower SRE counterparts. No significant differences were reported for these two persistence measures in the present study even though the means were in the expected direction.

Divergence in which specific persistence variables differed between SRE groups in the present study compared to Jung and Brawley's study may not be all that surprising. The two studies examined SRE beliefs for different domains of performance among different samples (and the relation of these SRE beliefs to persistence). Whereas the present study examined SRE to overcome barriers, recall that Jung and Brawley examined mothers' SRE to concurrently manage multiple goals (e.g., exercise, child care, and work). Although SRE beliefs in general should relate to people's persistence (Bandura, 1997), it is premature to assume that the same measures of persistence would differ across all SRE beliefs among different samples (e.g., students, working mothers). More research is needed to identify whether differences are consistently found in specific measures of persistence among samples who vary in their SRE beliefs across domains of performance important for adherence (e.g., concurrent management of multiple goals, overcoming barriers, scheduling and planning, etc.).

Regardless, there may be at least two explanations for the lack of significant differences in the two persistence measures between SRE groups after reading the higher challenge vignette in the present study (i.e., number of coping solutions and anticipatory persistence). Although findings from the vignette checks in the experiment illustrated that the higher challenge vignette was perceived by participants as being significantly more challenging than the lower challenge vignette, the manipulation may not have been sufficiently strong to cause consistent changes across all persistence measures. Recall that higher SRE participants scored the higher challenge vignette as a 5 and the lower SRE participants as a 6 on a 0 to 10 point scale (i.e., higher scores reflective of higher challenge) indicative of a moderate challenge. Although both groups rated the higher challenge vignette as significantly more challenging than the lower challenge vignette, perhaps the strength of the former vignette may not have been high enough level to elicit

consistent differences in the persistence measures. Suggestions for enhancing the degree of challenge in future work that may use vignettes is put forth in the future directions section.

A second explanation is that the vignettes may have inadvertently contained information that led to participants persisting less. The vignettes contained information on solutions to get to campus by means rather than walking only. The vignettes explained that the actor had faster ways to campus (e.g., biking, taking the bus). Despite the fact that the vignettes outlined that walking to campus was the goal behavior, the extent to which participants may have persisted could have decreased because they were given prompts about other means to get to campus. As self-efficacy theory (Bandura, 1997) would hypothesize, as the ease of other means getting to campus increases, persistence to perform the motivated, goal behavior should decrease. Thus, participants may have decided that they would take another means to campus, given in the vignettes, causing less persistence, particularly among the more efficacious group. Also, the lack of emphasized outcome expectancies in the vignettes could have contributed to less persistence (Bandura, 1997). Participants may have not been sufficiently motivated by the vignettes to persist in overcoming challenges because they did were not prompted with outcome expectations, a key motivating variable in self-efficacy theory (Bandura, 1997).

The findings of significant differences in the time taken to report solutions in the present study partly support hypotheses within the confines of the specific motivated behavior of walking. Specifically, people with higher SRE should remain task diagnostic and persist in carrying out a motivated behavior under challenging conditions (Bandura, 1997; Maddux & Gosselin, 2005). In contrast, lower efficacy individuals will give up more easily when faced with challenges, lacking persistence to achieve their desired attainment.

4.1 Strengths and Limitations

The present studies are not without limitations. Participants were mainly white and female volunteers, limiting generalizability to other populations. Further, the number of participants in the experimental study may not have been sufficient to detect significant between SRE group differences in all of the persistence measures. These two limitations occurred despite the use of various participant recruitment strategies over many months. A possible strategy to recruit a more diverse sample of university students in future research may include the use of incentives (e.g., gift card to a local coffee shop or campus bookstore). Another limitation may have been the inclusion of the barrier of being unmotivated in the higher challenge vignette. Recall that this barrier was included by the researcher (i.e., researcher error), but it did meet the criteria of being frequent (i.e., four or more times per week) but not limiting (i.e., above the limitation scale midpoint). Including this barrier in the higher challenge vignette could have decreased participants' perceived degree of challenge to a sufficient extent to cause inconsistent findings in the persistence variables.

Despite these limitations, the present research had strengths. Two strengths included the use of theory (Brawley, 1993; Painter et al., 2010) and an experimental design to investigate possible determinants of walking (i.e., persistence). To date, most AT research has been atheoretical (Ahlport et al., 2008; Butler, Orpana, & Wiens, 2007; Deehr & Shumann, 2009) and/or has employed cross-sectional or longitudinal correlational designs (Fuller et al., 2012). In contrast, the present study was designed to experimentally test the self-efficacy theory (Bandura, 1997) contention that persistence may be a factor in which higher and lower efficacious people differ when challenges to a motivated behavior arise. The present research represents the first test of this theoretical contention in the AT literature. Understanding the potential influence of

processes through which motivated behaviors occur has been highlighted as a target for investigation (Bandura, 1997; Duncan, Hall, Wilson, & Jenny, 2010; Hagger, Chatzisarantis, & Biddle, 2002).

A third strength was that careful consideration went into identifying relevant barriers. Benefits of this approach included the development of the experimental manipulation (i.e., the use of vignettes) that were believable and relevant to the study participants (i.e., as shown through the manipulation checks) and the development of SRE to overcome barriers measure. Ensuring that the vignettes were believable and relevant helped to maximize a common understanding of the vignettes across participants, adding internal validity to the experimental study (King & Wand, 2007; Royne, 2008).

4.2 Future Directions

Considering the low rates of walking (Basset et al., 2008; Bopp, Taczynski, & Campbell, 2013; Go for Green, 2008; Shephard, 2008; Shields, & Tjepkema, 2006) and the paucity of theory-based studies of this motivated behavior, continued research in the area is warranted. To overcome limitations such as those mentioned earlier, future research should recruit larger and more diverse samples. These efforts would also require continued work on identifying challenging barriers relevant to the diversity of the sample. It would be remiss to assume that the present study identified all possible challenging barriers to walking.

Future work should be undertaken to increase the degree of challenge in vignette-based experiments. Ideally, individuals should report that a higher challenge vignette is extremely challenging (i.e., at or near the ceiling of challenge manipulation check item). Doing so would provide in ideal situation to test self-efficacy theory contentions about persistence in higher and lower SRE individuals. For example, an experiment could be set up to include the specific

barriers that each participant reports as being extremely challenging on the initial SRE measure that is completed to sort individuals into higher and lower SRE groups (i.e., high frequency and high limitation). Then, only barriers identified as being extremely challenging could be included in a participant-specific vignette.

An additional research direction would be to investigate whether persistence is predictive of intentions to walk and/or actual walking behavior. For example, in an experimental setting, participants could be asked to rate their intention to walk after reading a higher and lower challenge vignette. Based on self-efficacy theory (Bandura, 1997), individuals with higher SRE to overcome barriers would be expected to intend to walk, whereas lower SRE individual would not, after reading a challenging scenario. Finally, other efficacy beliefs about self-regulatory actions could also be examined to determine if they are predictive of persistence in walking. Reviews by both Artinian and colleagues (2010) and Brawley and colleagues (2013) concluded that various cognitive behavioral strategies and related self-regulatory actions and efficacy beliefs should be integral parts of interventions to promote physical activity (e.g., self-monitoring, goal setting, and relapse prevention). Applying theory-based principles in an intervention to enhance SRE process variables may prove to be a key strategy in improving walking for AT rates in the long-term.

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APPENDIX A. RECRUITMENT MATERIAL – Pilot Phase 1

Online Bulletin-board Message

Participants Needed for a Study on Walking for Active Transportation to Campus

Are you interested in participating in a study about walking for active transportation?

We are interested in finding out about walking for active transportation to the U of S campus. We are interested in people who can tell us their barriers to walking for active transportation, are interested in reading a description about barriers and/or filling out some surveys on barriers.

To participate, we are looking for:

- Undergraduate or graduate students at the University of Saskatchewan, ages 17-26 years
- Must have walked to campus in the past 2 months from where you live
- Must have plans to walk again to campus from where you live in the next month
- Can't live in on-campus housing

Why is this study important?

This study is important to help us understand the barriers that students may have to walking for active transportation to campus. It will also help us understand some reasons why some people may be better able to deal with barriers than others.

What do you have to do to participate?

You are not required to participate in this study and there will be no consequences for you if you choose not to participate.

There will be no compensation or benefits for your participation. However, if this study is of interest to you, please contact the student researcher by email Michael Secora Walk2school.survey@usask.ca. Mike will then contact you with a link to the online survey. Taking the survey should only take approximately 15 minutes to do. Then, you might also be asked to come to our lab in the Physical Activities Complex for 25 minutes. You will be asked to read a short story and answer a paper survey.

Michael Secora
Walk2school.survey@usask.ca

Recruitment Poster

Participants Needed for a Study on Walking to the U of S Campus

Please take a tab at the bottom of the sheet to email us if you are interested in participating in the study

We are interested in finding out about walking to/from the U of S campus. We are interested in people who can tell us their barriers to walking for active transportation, are interested in reading a description about barriers, and/or filling out some surveys on these topics.

To participate, we are looking for:

- Undergraduate or graduate students at the University of Saskatchewan
- Have walked to or back home from campus in the past 2 months
- Have future plans to walk to or from campus
- Can't live in Voyageur Place (i.e. Saskatchewan Hall, Athabasca Hall, Qu'Appelle Hall and Addition)

Why is this study important?

This study is important to help us understand the barriers that students may have to walking for active transportation to campus. It will also help us understand some reasons why some people may be better able to deal with barriers than others.

What do you have to do to participate?

You are not required to participate in this study. There will be no consequences for you if you choose not to participate. There will be no compensation or benefits for your participation.

However, if this study is of interest to you, please take a tab at the bottom of the page and **email the graduate student researcher, Michael Secora at: Walk2school.survey@usask.ca**

Mike will then contact you with a link to the online survey that will take about 5 minutes to do. Then, you might also be asked to come to our lab on the U of S campus for 15 - 25 minutes on 1 to 3 occasions to do a paper survey and maybe read a short story.

If interested, please email us – take a tab below:

Michael Secora walk2school.survey@usask.ca

Michael Secora walk2school.survey@usask.ca
Michael Secora walk2school.survey@usask.ca
Michael Secora walk2school.survey@usask.ca
Michael Secora walk2school.survey@usask.ca
Michael Secora walk2school.survey@usask.ca
Michael Secora walk2school.survey@usask.ca

In-class Recruitment Flyer

Participants Needed for a Study on Walking for Active Transportation to Campus

Are you interested in participating in a study about walking for active transportation?

We are interested in finding out about walking for active transportation to the U of S campus. We are interested in people who can tell us their barriers to walking for active transportation, are interested in reading a description about barriers and/or filling out some surveys on these topics.

To participate, we are looking for:

- Undergraduate or graduate students at the University of Saskatchewan, ages 17-26 years
- Must have walked to campus in the past 2 months from where you live
- Must have plans to walk again to campus from where you live in the next month
- Can't live in on-campus housing

Why is this study important?

This study is important to help us understand the barriers that students may have to walking for active transportation to campus. It will also help us understand some reasons why some people may be better able to deal with barriers than others.

What do you have to do to participate?

You are not required to participate in this study and there will be no consequences for you if you choose not to participate.

There will be no compensation or benefits for your participation. However, if this study is of interest to you, please contact the student researcher by email Michael Secora Walk2school.survey@usask.ca. Mike will then contact you with a link to the online survey. Taking the survey should only take approximately 15 minutes to do. Then, you might also be asked to come to our lab in the Physical Activities Complex for 25 minutes. You will be asked to read a short story and answer a paper survey.

Name (please print): _____

Email (please print): _____

☐ I want to be emailed about this study.
☐ I do not want to be emailed about this study.

APPENDIX B. INCLUSION CRITERIA

Email address:

Verify email address:

1) What is your current age?

_____ years

2a) Are you a student at the University of Saskatchewan (U of S)?

☐ No
☐ Yes

2b) If yes, please check (✓) your <u>current</u> student status:

☐ 1st year undergraduate student
☐ 2nd year undergraduate student
☐ 3rd year undergraduate student
☐ 4th year undergraduate student
☐ 5th year or above undergraduate student
☐ Masters graduate student or equivalent degree
☐ PhD graduate student or equivalent degree

3) Do you live in Voyager Place (i.e. Saskatchewan Hall, Athabasca Hall, Qu'Appelle Hall and Addition)?

☐ No
☐ Yes

4a) How far do you live from the U of S campus?

_____ kilometres

4b) Do you live close enough to campus that you could walk to campus if you wanted to?

☐ Yes
☐ No

5) Have you walked to/ from the U of S campus in the past 2 months (8 weeks)?

☐ No
☐ Yes – If yes, please provide the information below. Make sure you answer in whole numbers (such as 1,2,3, etc.)

<u>In the past 2 months (8 weeks)</u>:

a) How **many times, in total**, did you walk **FROM HOME TO CAMPUS <u>in a typical week</u>**: _____

b) How **many times, in total**, did you walk **FROM CAMPUS TO HOME <u>in a typical week</u>**: _____

6) Do you plan to walk to/from the U of S campus over the next month (4 weeks)?

☐ No
☐ Yes – If yes, please provide the information below. Make sure you answer in whole numbers (such as 1,2,3, etc.)

In the next month (4 weeks):

a) How **many times do you plan** on walking **FROM HOME TO CAMPUS <u>in a typical week</u>**: _____

b) How **many times do you plan** on walking **FROM CAMPUS TO HOME <u>in a typical week</u>**: _____

8) Check (✓) <u>all of the ways</u> that <u>YOU</u> can realistically get to/from the U of S campus <u>in a typical week</u>. This doesn't mean that you actually use these ways, but you would have an option to if you wanted:

☐ Walk
☐ Drive my car
☐ Catch a ride with friends/carpool
☐ Take a bus
☐ Bike
☐ Roller blade
☐ Skateboard
☐ Other: please list:

---

9) Please check <u>1 of the following that best describes</u> when you walk to/from campus in a typical week (check 1 only):

☐ <u>Walking</u> is the <u>only way</u> you can get to/from campus
☐ You <u>sometimes</u> have an option to get to/from campus by another way, other than walking (e.g., bus, drive, bike, etc.)
☐ You <u>always</u> have an option to get to/from campus by another way, other than walking (e.g., bus, drive, bike, etc.)

10) How long have you been walking to the U of S campus? Add up all of the weeks that you walked to/from the U of S at least once during a week? (4 weeks = 1 month)

☐ Less than 6 months
☐ 6 months to 1 year
☐ Over 1 year and up to 2 years
☐ Over 2 years and up to 3 years
☐ Over 3 years and up to 4 years
☐ Over 4 years

11) Do you walk, on average, 3 days per week to the University? Some weeks you may walk 5 days, other weeks you may only walk once, but, your average is at least 3 days per week)

☐ Yes
☐ No

APPENDIX C. DEMOGRAPHIC SURVEY – Pilot Phase 1

Email address:

Verify email address:

1) **What is your gender (check ✓ one)?**
   - ☐ Female
   - ☐ Male

2) **What is your College (check✓ one)?**
   - ☐ Arts & Science
   - ☐ Commerce
   - ☐ Agriculture
   - ☐ Law
   - ☐ Medicine
   - ☐ Engineering
   - ☐ Kinesiology
   - ☐ Unclassified Studies
   - ☐ Graduate Studies

3) **Which most represents you?**
   - ☐ Full time student (12+ registered hours of class) and full time worker (40+ hours a week)
   - ☐ Full time student and part time worker (less than 40 hours a week)
   - ☐ Full time student and no employment for money
   - ☐ Part time student (less than 12 registered hours of class) and full time worker (40+ hours a week)
   - ☐ Part time student and part time worker (less than 40 hours a week)
   - ☐ Part time student and no employment for money
   - ☐ Other

4) **What is the main reason or reasons that you walk to the University of Saskatchewan. Please select all that apply then rank the reasons in order from the highest priority to the lowest priority.**
   - ☐ Going Green (environmental)
   - ☐ Save Money (e.g. buy less gas, spend less on parking)
   - ☐ For health benefits
   - ☐ Enjoy walking
   - ☐ Enjoy being outside
   - ☐ Saves time

Please Number and Rank the reasons for walking below. Feel free to add any other reasons why you walk to the University of Saskatchewan that were not on the list above.

_____

_____

_____

_____

_____

5) **How tall are you without your shoes?** _____Feet _____Inches

6) **How much do you weigh without your shoes? _____pounds**

7) **Regardless of your nationality, which of the following would you use to best describe your ancestry (check ✓ all that apply)?**

- ☐ White
- ☐ Chinese
- ☐ Black
- ☐ Filipino
- ☐ Latin American
- ☐ Southeast Asian
- ☐ South Asian
- ☐ West Asian
- ☐ North American Indian, Metis, or Inuit
- ☐ Arab
- ☐ Other

8) **What is your marital status (check ✓ one)?**

- ☐ Married
- ☐ Divorced
- ☐ Widowed
- ☐ Single
- ☐ Not married, but living with a partner

9) **What is the approximate range of your household TOTAL INCOME from ALL SOURCES (check ✓ one)?**

☐$0-9,999

☐$10,000-19,999

☐$20,000-29,999

☐$30,000-39,999

☐$40,000-49,999

☐$50,000-59,999

☐$60,000-69,999

☐$70,000-79,999

☐$80,000 or more

10) What is your postal code? _____

11) How long have you lived in Saskatchewan? _____ years _____ months

12) What is the main reason you walk to the University of Saskatchewan?

☐ For health reasons

☐ For the environment (reduce carbon footprint)

☐ For economic reasons (save money)

☐ You enjoy walking

☐ Other, if Other, please explain. _____

13. Your preference to walk to the University of Saskatchewan?

1	2	3	4	5	6	7	8	9
Like to walk								Have to walk

14. Considering the past 2 months, how difficult was it for you to walk to the University of Saskatchewan?

1	2	3	4	5	6	7	8	9
Very Difficult				Moderate				Very Easy

15. Considering the past 2 months, how much of a challenge was it for you to walk to the University of Saskatchewan?

1	2	3	4	5	6	7	8	9

Not Challenging at all								Very Challenging

The following questions will ask you about your exercise. When answering, please **do not include your** active transportation to the U of S campus as part of your reported physical activity.

During a typical 7-day period (a week), how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free time (write on each line the appropriate number).

Times per week

16) Strenuous exercise (heart beats rapidly) _____

(e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)

17) Moderate exercise (not exhausting) _____

(e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

18) Mild exercise (minimal effort) _____

(e.g., archery, fishing from a river bank, bowling, horseshoes, golf, snow-mobiling, easy walking, bocce-ball)

During a typical 7-day period (a week), in your leisure time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?

Often _____

Sometimes _____

Never/Rarely_____

For the next set of questions, **do include** active transportation as part of your reported exercise.

During a typical 7-day period (a week), how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free time (write on each line the appropriate number).

Times per week

19) Strenuous exercise (heart beats rapidly) _____

(e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)

20) Moderate exercise (not exhausting) _____

(e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

21) Mild exercise (minimal effort) _____

(e.g., archery, fishing from a river bank, bowling, horseshoes, golf, snow-mobiling, easy walking, bocce-ball)

During a typical 7-day period (a week), in your leisure time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?

Often _____

Sometimes _____

Never/Rarely_____

APPENDIX D. BARRIERS ELICITATION

Barriers to Walking for Active Transportation to/from the U of S Campus

We are interested in any *barriers* that you may have when trying to walk for active transportation to/from the U of S campus. Some barriers may completely stop you from walking. Other barriers may make it hard for you to walk, but in the end, you deal with them and end up walking.

Barriers may have to do with you, personally, like not being able to find your walking shoes. Barriers can also have to do with things outside of you, like someone you normally walk with is sick.

Think back to the times when you walked to/from the U of S campus and the barriers that you faced.

Below is a list of barriers. For each barrier, we will ask you to report:

a) If you ever faced the barrier and if so:
b) How often the barrier occurred in the typical month (4 weeks).
c) How limiting the barrier was to you walking to/from campus.

1a) Have you faced the barrier of: <u>The distance to walk</u> to/from the U of S campus <u>was too far</u>?

_____ **No** (If no, skip to question #2)
_____ **Yes** (If yes, answer the following questions):

1b) How <u>many times</u> did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times <u>in a typical month</u> (4 weeks)

1c) How much did this barrier <u>limit you</u> from walking to/from the U of S campus in a typical month (4 weeks)? Circle one number only.

1	2	3	4	5	6	7	8	9
<u>Did not</u> limit/stop me				<u>Moderately</u> limited me from				<u>Completely</u> limited/stopped

from walking to/from campus				walking to/from campus				me from walking to/from campus

2a) Have you faced the barrier of: <u>Not having enough time</u> to walk to/from the U of S campus?

_____**No** (If no, skip to question #3)
_____**Yes** (If yes, answer the following questions):

2b) How <u>many times</u> did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a <u>typical month</u> (4 weeks)

2c) How much did this barrier <u>limit you</u> from walking to/from the U of S campus in a <u>typical month</u> (4 weeks)?

1	2	3	4	5	6	7	8	9
<u>Did not</u> limit/stop me from walking to/from campus				<u>Moderately</u> limited me from walking to/from campus				<u>Completely</u> limited/stopped me from walking to/from campus

3a) Have you faced the barrier of: <u>Having another way</u> to get to/from the U of S campus (e.g., ride with friends, biking)?

_____**No** (If no, skip to question #4)
_____**Yes** (If yes, answer the following questions):

3b) How <u>many times</u> did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a <u>typical month</u> (4 weeks)

3c) How much did this barrier <u>limit you</u> from walking to/from the U of S campus in a <u>typical month</u> (4-weeks)?

1	2	3	4	5	6	7	8	9
<u>Did not</u> limit/stop me from walking to/from campus				<u>Moderately</u> limited me from walking to/from campus				<u>Completely</u> limited/stopped me from walking to/from campus

4a) Have you faced the barrier of: Your route not being safe enough to walk to/from the U of S campus?

_____**No** (If no, skip to question #5)
_____**Yes** (If yes, answer the following questions):

4b) How many times did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a typical month (4 weeks)

4c) How much did this barrier limit you from walking to/from the U of S campus in a typical month (4 weeks)?

1	2	3	4	5	6	7	8	9
Did not limit/stop me from walking to/from campus				Moderately limited me from walking to/from campus				Completely limited/stopped me from walking to/from campus

5a) Have you faced the barrier of: <u>Rainfall/puddles being too bad</u> to walk to/from the U of S campus?

_____**No** (If no, skip to question #6)
_____**Yes** (If yes, answer the following questions):

5b) How <u>many times</u> did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a <u>typical month</u> (4 weeks)

5c) How much did this barrier <u>limit you</u> from walking to/from the U of S campus in a <u>typical month</u> (4-weeks)?

1	2	3	4	5	6	7	8	9
<u>Did not</u> limit/stop me from walking to/from campus				<u>Moderately</u> limited me from walking to/from campus				<u>Completely</u> limited/stopped me from walking to/from campus

6a) Have you faced the barrier of: Snowfall/snow being too bad to walk to/ from the U of S campus?

_____**No** (If no, skip to question #7)
_____**Yes** (If yes, answer the following questions):

6b) How many times did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a typical month (4 weeks)

6c) How much did this barrier limit you from walking to/from the U of S campus in a typical month (4 weeks)?

1	2	3	4	5	6	7	8	9
Did not limit/stop me from walking to/from campus				Moderately limited me from walking to/from campus				Completely limited/stopped me from walking to/from campus

7a) Have you faced the barrier of: <u>The temperature being too hot</u> to walk to/from the U of S campus?

_____**No** (If no, skip to question #8)
_____**Yes** (If yes, answer the following questions):

7b) How <u>many times</u> did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a <u>typical month</u> (4 weeks)

7c) How much did this barrier <u>limit you</u> from walking to/from the U of S campus in a <u>typical month</u> (4 weeks)?

1	2	3	4	5	6	7	8	9
<u>Did not</u> limit/stop me from walking to/from campus				<u>Moderately</u> limited me from walking to/from campus				<u>Completely</u> limited/stopped me from walking to/from campus

8a) Have you faced the barrier of: <u>The temperature being too cold</u> to walk to/from the U of S campus?

_____**No** (If no, skip to question #9)
_____**Yes (**If yes, answer the following questions):

8b) How <u>many times</u> did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a <u>typical month</u> (4 weeks)

8c) How much did this barrier <u>limit you</u> from walking to/from the U of S campus in a <u>typical month</u> (4 weeks)?

1	2	3	4	5	6	7	8	9
<u>Did not</u> limit/stop me from walking to/from campus				<u>Moderately</u> limited me from walking to/from campus				<u>Completely</u> limited/stopped me from walking to/from campus

9a) Have you faced the barrier of: <u>Not being motivated</u> to walk to/from the U of S campus?

_____**No** (If no, skip to question #10)
_____**Yes** (If yes, answer the following questions):

9b) How <u>many times</u> did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a <u>typical month</u> (4 weeks)

9c) How much did this barrier <u>limit you</u> from walking to/from the U of S campus in a <u>typical month</u> (4 weeks)?

1	2	3	4	5	6	7	8	9
<u>Did not</u> limit/stop me from walking to/from campus				<u>Moderately</u> limited me from walking to/from campus				<u>Completely</u> limited/stopped me from walking to/from campus

10a) Have you faced the barrier of: It being <u>too dark outside</u> to walk to/from the U of S campus?

_____**No (**If no, skip to question #11)
_____**Yes (**If yes, answer the following questions):

10b) How <u>many times</u> did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a <u>typical month</u> (4 weeks)

10c) How much did this barrier <u>limit you</u> from walking to/from the U of S campus in a <u>typical month</u> (4 weeks)?

1	2	3	4	5	6	7	8	9
<u>Did not</u> limit/stop me from walking to/from campus				<u>Moderately</u> limited me from walking to/from campus				<u>Completely</u> limited/stopped me from walking to/from campus

11a) Have you faced the barrier of: The traffic being too busy to walk to/from the U of S campus?

_____**No** (If no, skip to question #12)
_____**Yes** (If yes, answer the following questions):

11b) How many times did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a typical month (4 weeks)

11c) How much did this barrier limit you from walking to/from the U of S campus in a typical month (4 weeks)?

1	2	3	4	5	6	7	8	9
Did not limit/stop me from walking to/from campus				Moderately limited me from walking to/from campus				Completely limited/stopped me from walking to/from campus

12a) Have you faced the barrier of: A <u>boring walking route</u> to/from the U of S campus?

_____**No** (If no, skip to question #13)
_____**Yes** (If yes, answer the following questions):

12b) How <u>many times</u> did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a <u>typical month</u> (4 weeks)

12c) How much did this barrier <u>limit you</u> from walking to/from the U of S campus in a <u>typical month</u> (4 weeks)?

1	2	3	4	5	6	7	8	9
<u>Did not</u> limit/stop me from walking to/from campus				<u>Moderately</u> limited me from walking to/from campus				<u>Completely</u> limited/stopped me from walking to/from campus

13a) Have you faced the barrier of: An isolated walking route to/from the U of S campus (e.g., no one else is around)?

_____**No** (If no, skip to question #14)
_____**Yes** (If yes, answer the following questions):

13b) How many times did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a typical month (4 weeks)

13c) How much did this barrier limit you from walking to/from the U of S campus in a typical month (4 weeks)?

1	2	3	4	5	6	7	8	9
Did not limit/stop me from walking to/from campus				Moderately limited me from walking to/from campus				Completely limited/stopped me from walking to/from campus

14a) Have you faced the barrier of: <u>Getting too hot/sweaty</u> when walking to/from the U of S campus?

_____**No** (If no, skip to question #15)
_____**Yes** (If yes, answer the following questions):

14b) How <u>many times</u> did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a <u>typical month</u> (4 weeks)

14c) How much did this barrier <u>limit you</u> from walking to/from the U of S campus in a <u>typical month</u> (4 weeks)?

1	2	3	4	5	6	7	8	9
<u>Did not</u> limit/stop me from walking to/from campus				<u>Moderately</u> limited me from walking to/from campus				<u>Completely</u> limited/stopped me from walking to/from campus

15a) Have you faced the barrier of: Having a heavy backpack/too much to carry to walk to/from the U of S campus?

_____**No** (If no, skip to question #16)
_____**Yes** (If yes, answer the following questions):

15b) How many times did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a typical month (4 weeks)

15c) How much did this barrier limit you from walking to/from the U of S campus in a typical month (4 weeks)?

1	2	3	4	5	6	7	8	9
Did not limit/stop me from walking to/from campus				Moderately limited me from walking to/from campus				Completely limited/stopped me from walking to/from campus

16a) Have you faced the barrier of: <u>Feeling too stressed</u> to walk to/from the U of S campus?

_____**No** (If no, skip to the open-ended barriers section)
_____**Yes** (If yes, answer the following questions):

16b) How <u>many times</u> did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a <u>typical month</u> (4 weeks)

16c) How much did this barrier <u>limit you</u> from walking to/from the U of S campus in a <u>typical month</u> (4 weeks)?

1	2	3	4	5	6	7	8	9
<u>Did not</u> limit/stop me from walking to/from campus				<u>Moderately</u> limited me from walking to/from campus				<u>Completely</u> limited/stopped me from walking to/from campus

Other Barriers

If you have experienced other barriers that did not appear on the list, please list them below. You can list up to 3 more barriers.

1a) Explain barrier #1 – please be as specific as possible:

1b) How many times did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a typical month (4 weeks)

1c) How much did this barrier limit you from walking to/from the U of S campus in a typical month (4 weeks)? Circle one number only.

1	2	3	4	5	6	7	8	9
Did not limit/stop me from walking to/from campus				Moderately limited me from walking to/from campus				Completely limited/stopped me from walking to/from campus

2a) Explain barrier #2 – please be as specific as possible:

2b) How many times did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a typical month (4 weeks)

2c) How much did this barrier limit you from walking to/from the U of S campus in a typical month (4 weeks)? Circle one number only.

1	2	3	4	5	6	7	8	9
Did not limit/stop me from walking to/from campus				Moderately limited me from walking to/from campus				Completely limited/stopped me from walking to/from campus

3) Explain barrier #3 – please be as specific as possible:

3b) How many times did this barrier make it hard or stop you from walking to/from the U of S campus in a typical month during the school year?

_____ total number of times in a typical month (4 weeks)

3c) How much did this barrier limit you from walking to/from the U of S campus in a typical month (4 weeks)? Circle one number only.

1	2	3	4	5	6	7	8	9
Did not limit/stop me from walking to/from campus				Moderately limited me from walking to/from campus				Completely limited/stopped me from walking to/from campus

APPENDIX E. INTERVIEW QUESTIONS

Barriers elicitation (Phase 1)

1a) What would be the most challenging barrier or combination of barriers that would absolutely stop you from walking to or back home from the U of S campus?

1b) Follow up: Can you think of any other barriers that would stop you from walking to or back from campus?

1c) Follow up: I am interested in whether any of the barriers that you mentioned vary by the season you are walking in, like in the fall, winter, spring or summer? In other words, are some barriers more challenging in the fall, winter, spring, or summer when you walk to or back from campus?

2a) Can you think of a barrier or a combination of barriers that may come up but are extremely easy to deal with so that you end up walking to or back home from campus?

2b) Follow up: Can you think of any other barriers that are really easy to overcome?

2c) Follow up: Do any of the barriers you mentioned vary in how easy they are to overcome in the fall, winter, spring, or summer? In other words, are some barriers easiest to overcome in the fall, winter, spring, or summer when you walk to or back from campus?

Check of the scenarios and check of the self-regulatory efficacy to overcome barriers survey (Phase 2)

Scenario Check

1) Do you think that the two scenarios are different in regards to how challenging you think they are to walking to/from the U of S campus (i.e. 1 is more challenging than the other)?
2) Is there anything you can think of to make the scenarios more readable, believable and more or less challenging (according to the high challenging/low challenging scenarios)?
3) Is there anything we can do/change to make it easier to read, more believable or easier to relate to?

Self-regulatory Efficacy Check

1a) Are there any parts of the measure that you didn't understand?

1b) Are there any parts of the measure that you were confused on what was being asked or how to answer a question?

2) Is there anything we can do/change to make it easier to read or understand?

APPENDIX F. DEMOGRAPHIC DATA FOR PILOT PHASE 1 AND PHASE 2

Extra Demographics from Pilot Study

		Pilot Phase 1	Pilot Phase 2	Total
Category		*n = 8*	*n = 9*	*n = 12**
Reasons for Walking	Stores and shops	7	9	10
	Meet friends at homes	4	4	5
	Meet friends at shops to socialize	5	5	6
	Parks/Rec facilities	6	6	7
	Church	1	0	1
	Work	0	1	1
	Fitness facility	0	0	0
	Communal activities	1	0	1
AT to other places	Health benefits	5	6	7
	Cut carbon emissions	4	3	4
	Save money	4	6	7
	Enjoyment	6	6	7
	Socialize	0	0	0
	Relaxation	1	2	2
	No other means	2	0	2
	No car	1	0	1
	Prefer to walk	0	1	1
	Path is not bike friendly	1	0	1
Other AT modes	Biking	7	6	8
	Rollerblading	2	3	3
	Skateboard	0	0	0
	Longboard	1	0	1

* *Note.* The total number is based on the total amount of participants in both Pilot phases not duplicating data from those who participated in both phases

Extra Demographics from Pilot Study

	Pilot Phase 1	Pilot Phase 2
Category	*M* (*SD*)	*M* (*SD*)
BMI	24.55 kg/m^2 (4.49)	23.32 kg/m^2 (3.71)
Years lived in Saskatoon	8.84 years (8.97)	11.86 years (14.88)
Average distance from campus	2.79 km (.85)	2.50 km (.75)
Difficulty	5.63 (1.77)	5.67 (1.66)
Challenging	2.00 (1.20)	2.56 (2.01)
Godin Leisure without AT	57.81 (35.68)	51.61 (37.55)
Godin Leisure with AT	78.75 (40.13)	74.89 (41.28)

Note. Difficulty was assessed on a 1 (*very difficult*) to 9 (*very easy*) response scale.
Challenge was assessed on a 1 (*not challenging at all*) to 9 (*very challenging*) response scale.

APPENDIX G. SRE TO OVERCOME BARRIERS

We are interested in your confidence to overcome *barriers* that you may have when trying to carry out your plans to walk to/from the U of S campus in the next 4 weeks.

Barriers can make it difficult or completely stop you from walking to/from campus. We have listed a number of barriers below.

For each barrier, we will ask you to report:

a) If you expect the barrier to come up when you walk to/from campus.

b) If yes, then we will ask you to report your confidence that you can overcome the barrier so that you walk to/from campus as planned.

Please proceed to the next page when you have read and understand the instructions above.

1a. Will it being dark out be a barrier to you walking to/from the U of S campus in the next four weeks?

Yes _____
No_____

1b. In the next 4 weeks, how confident are you in your abilities to overcome this barrier and do your planned walking to/from campus?

0 Not at all confident	1	2	3	4	5 Moderately confident	6	7	8	9	10 Completely confident

2a. Will getting sweaty on your walk be a barrier to you walking to/from the U of S campus in the next four weeks?

Yes _____
No_____

2b. In the next 4 weeks, how confident are you in your abilities to overcome this barrier and do your planned walking to/from campus?

0 Not at all confident	1	2	3	4	5 Moderately confident	6	7	8	9	10 Completely confident

3a. Will <u>being unmotivated</u> be a barrier to you walking to/from the U of S campus in the next four weeks?

Yes _____
No_____

3b. In the next 4 weeks, how confident are you in your abilities to overcome this barrier and do your planned walking to/from campus?

0 Not at all confident	1	2	3	4	5 Moderately confident	6	7	8	9	10 Completely confident

4a. Will <u>snow (either falling snow or snow on the ground)</u> be a barrier to you walking to/from the U of S campus in the next four weeks?

Yes _____
No_____

4b. In the next 4 weeks, how confident are you in your abilities to overcome this barrier and do your planned walking to/from campus?

0 Not at all confident	1	2	3	4	5 Moderately confident	6	7	8	9	10 Completely confident

5a. Will <u>cold weather</u> be a barrier to you walking to/from the U of S campus in the next four weeks?

Yes _____
No_____

5b. In the next 4 weeks, how confident are you in your abilities to overcome this barrier and do your planned walking to/from campus?

0 Not at all confident	1	2	3	4	5 Moderately confident	6	7	8	9	10 Completely confident

6a. Will walking with a heavy backpack be a barrier to you walking to/from the U of S campus in the next four weeks?

Yes _____
No_____

6b. In the next 4 weeks, how confident are you in your abilities to overcome this barrier and do your planned walking to/from campus?

0 Not at all confident	1	2	3	4	5 Moderately confident	6	7	8	9	10 Completely confident

7a. Will lack of time to walk be a barrier to you walking to/from the U of S campus in the next four weeks?

Yes _____
No_____

7b. In the next 4 weeks, how confident are you in your abilities to overcome this barrier and do your planned walking to/from campus?

0 Not at all confident	1	2	3	4	5 Moderately confident	6	7	8	9	10 Completely confident

8a. Will rain/puddles be a barrier to you walking to/from the U of S campus in the next four weeks?

Yes _____
No_____

8b. In the next 4 weeks, how confident are you in your abilities to overcome this barrier and do your planned walking to/from campus?

0 Not at all confident	1	2	3	4	5 Moderately confident	6	7	8	9	10 Completely confident

9a. Will having other ways to get to campus be a barrier to you walking to/from the U of S campus in the next four weeks?

Yes _____
No_____

9b. In the next 4 weeks, how confident are you in your abilities to overcome this barrier and do your planned walking to/from campus?

0 Not at all confident	1	2	3	4	5 Moderately confident	6	7	8	9	10 Completely confident

APPENDIX H. SRE TO OVERCOME BARRIERS CHECK

Keep in mind the survey you just answered.

Please rate your agreement for each of the following questions and **circle the number** that best represents your answer:

1. The survey was easy to read.

0	1	2	3	4	5	6	7	8	9	10

Not Easy at All — **Moderately Easy** — **Very Easy**

2. How similar where the barriers to your own barriers you've experienced in the past when you walked for active transportation?

0	1	2	3	4	5	6	7	8	9	10

Not Easy at Similar — **Moderately Similar** — **Very Similar**

3. Please write any comments or suggestions below on how to make the survey easier to understand or read.

APPENDIX I. Distractor Task

Math Problems

Do as many math problems as you can in 5 minutes. I will stop you after 5 minutes.

-13 + -70	-26 - 95	59 + -63	16 × 8	6 × -15
-85 + -25	27 + 85	-19 + 32	-62 - 100	-32 - -25
-90 - 37	96 ÷ 6	-11 - -25	11 - 89	-15 ÷ -10
-46 + -99	-41 - -80	11 × 18	17 × 8	7 × -12
23 × 12	17 × -8	45 - 96	124 ÷ 4	32 - 129
-27 - 70	63 + -25	145 × -38	122 × 18	31 - 67
24 - -87	28 × 89	29 + 19	88 ÷ 4	-13 × 43
-15 - 35	-6 - -14	10 × -2	72 + -89	-16 × -10

APPENDIX J. HIGHER AND LOWER CHALLENGE VIGNETTES – Pilot Phase 1

Higher Challenge Vignette

Instructions: Please read through the following story carefully. You may have already experienced situations like those described below. Please consider yourself in this situation as you read through the story.

John is a student at the University of Saskatchewan. He was born in Ontario but has lived in Saskatchewan for most of his life. After he graduates, he plans to get a full time job in the city. John has been active, off and on, for most of his life playing recreational sports and doing other outdoor physical activities with friends or on his own.

Ever since John has been going to the U of S, he has lived close enough to campus that he could walk there. He enjoys walking to campus especially when the weather is nice. John believes that walking will make him healthier, save him money on gas and other transportation costs, like car repairs and parking, and reduce his carbon footprint (meaning less carbon emissions because of his walking for travel).

During a typical week of school, John thinks about what he will need with him on campus for the day and then walks to his first class. He stays on campus for the rest of the day, going to classes, doing homework, and visiting with his friends. After his last class, he walks home. Although John walks regularly to campus, he believes it will be especially hard to do so in the upcoming week – it will be the middle of October already.

He has lots going on outside of what he normally does, which will make walking especially challenging. He has made a lot of other commitments this week; everything seems to have piled up this one week. He is going to keep these other commitments, as he is not one to back out. For example, he promised to get together with friends for a couple different birthday parties, he also has to go to a dinner fundraiser, and then he has family coming to visit for a couple of nights. Having so many commitments will make it tougher for him to fit in time to walk to the university. To top it off, because John is pressed for time, he has less motivation to walk to campus. He also knows that he will have a few other ways to get to campus that would be quicker - making it all the more tempting to do. He knows that he could drive, take the bus, or catch a ride with a friend.

A typical week in the middle of October, from John's own experience, is when nights are beginning to get cool but usually the temperature is quite nice when he walks. However, this week is not very typical. It is going to get quite cold and will likely be snowing for most of the week. Although he has spent most of his life in the province, he just cannot seem to get used to the cold weather and snow, especially when it comes earlier than expected. He keeps thinking that it is still only the fall and he has to face the cold and snow already.

Now, thinking about all of his other plans that will cut into his time, the fact that he could get to campus another way, and the bad weather that is coming, he feels really unmotivated to walk to and from campus.

Lower Challenge Vignette

Instructions: Please read through the following story carefully. You may have already experienced situations like those described below. Please consider yourself in this situation as you read through the story.

John is a student at the University of Saskatchewan. He was born in Ontario but has lived in Saskatchewan for most of his life. After he graduates, he plans to get a full time job in the city. John has been active, off and on, for most of his life playing recreational sports and doing other outdoor activities with friends or on his own.

Ever since John has been going to the U of S, he has lived close enough to campus that he could walk there. He enjoys walking to campus especially when the weather is nice. John believes that walking will make him healthier, save him money on gas and other transportation costs, like car repairs and parking, and reduce his carbon footprint (meaning less carbon emissions because of his walking for travel).

During a typical week of school, John thinks about what he will need with him on campus for the day and then walks to his first class. He stays on campus for the rest of the day, going to classes, doing homework, and visiting with his friends. After his last class, he walks home.

Currently it is the middle of October already and he can't believe how fast the term is flying by. He thinks ahead to the next week of school and about whether he can keep walking regularly. He is happy because even though a few things seem like they will come up that may make it a bit harder than usual to walk, he knows he can still do it. However, he has a few things to do outside of school - though it's not any different from any other weeks in the term. He is happy that he finally won't have any exams or quizzes in the week – it's nice to have a break from cramming for them until the next round hits. It seems like every year at this time of the term he gets a nice break from the usual demands of school. He knows that he will have more time to hang out with his friends and just relax a bit more than usual. He knows that he can also get caught up on his laundry and other stuff like that.

John decides to check the weather for the week. He thinks back to other years - a typical week in the middle of October, from his own experiences, is when nights are beginning to get cool but usually the temperature is quite nice when he walks. However, this week is not very typical. It will likely be snowing for most of the week. Although he has spent most of his life in the province, he just cannot seem to get used to the snow, especially when it comes earlier than expected. He keeps thinking that it is still only the fall and he has to face the snow already. This makes John feel like he won't be quite as motivated to walk as other weeks.

Even though John thinks he may be less motivated to walk because of the snow, he still has the desire to keep walking regularly to and back home from campus.

APPENDIX K. VIGNETTE BELIEVABILITY AND RELEVANCE CHECK

Keep in mind the written story you just read.

Please rate your agreement for each of the following questions and **circle the number** that best represents your answer:

1. Was the story was easy to read?

0	1	2	3	4	5	6	7	8	9	10

Not Easy at All — **Moderately Easy** — **Very Easy**

2. To what extent were the experiences of the person in the scenario similar to your own?

0	1	2	3	4	5	6	7	8	9	10

Not Similar at All — **Moderate Similar** — **Very Similar**

3. How challenging is it for the person in the story to walk to/from the U of S campus?

0	1	2	3	4	5	6	7	8	9	10

Not Challenging at All — **Moderately Challenging** — **Very Challenging**

4. Does the person in the story seem to be an expert/be experienced in walking to/from the U of S campus?

0	1	2	3	4	5	6	7	8	9	10

Not at All an Expert Expert — **Moderately an Expert** — **Very Much an**

5. To what extent was the story aimed at people like you?

0	1	2	3	4	5	6	7	8	9	10

Not Similar at All — **Moderate Similar** — **Very Similar**

6. To what extent was the story believable?

0	1	2	3	4	5	6	7	8	9	10

Not Believable at All — **Moderate Believable** — **Very Believable**

7. What are some suggestions that you might have for making this story more believable?

_____

_____

_____

_____

_____

_____

8. Which one of the stories was had more challenges to walking to/from campus for the person in it? Check one only.[2]

First story you read _____
Second story you read _____

[2] Question 8 was provided only after the participant read the second vignette.

APPENDIX L. DETAILED RESPONSE FOR OPEN-ENDED VIGNETTE

1. Barrier, pretty much only barrier for him is having to wear dress clothes for presentation or conference etc. He will not walk if he has to wear dress clothes. Being from Saskatchewan, -40C doesn't bother him however, it is harder at the peaks of winter and summer to walk when it is -40C or +45C.

There is no accumulation of barriers it is just one barrier that will keep him from walking.

2. Below -40C (Feels like) and above 30 -35C will keep her from walking. If she is running very very late, she would drive, unless it is in the winter (in which it takes the same amount of time).

Rain is easy to deal with via umbrella. Heavy load is easy to deal with. If there is a lot on her mind/not motivated, recognizing the walk will make her feel better makes it easy to deal with.

Other notes: She walks 5 days per week in just about everything.

3. Don't feel like getting out of bed or if he doesn't need to be at school (can work from home).

Below -35C (absolute) will keep him from walking. When it is "nice" outside he prefers faster modes of transportation (bike and rollerblade), however rain becomes a barrier for these modes and he walks. He always walks in the winter (as he can't bike or rollerblade in the snow).

Rain doesn't seem to be a full barrier to completely stop you from walking.

Time is easy to overcome, just schedule your day.

4. Time – time that walking takes or time he has to get to school, (running late) takes 30 minutes to walk to school, -40 with windchill is "too much"

Weather, backpack etc. is not an issue, "he can accommodate". Snow is not a big deal but he knows it will take longer.

5. Backpack is way too heavy, English major = lots of books, "too cold" but has walked through blizzards – cold or dark would rather take other option like bus. Running late – look for bus or car, if not roller blading or biking rather than walking.

Don't have the energy but she finds once she gets walking she finds it is a nice walk and gets more energy. It just takes energy to get out of the door. Not enough time to do what she needs to do, but walking gives her energy to do the stuff she needs to do.

She likes safewalk, when it was dark, it was nice for people to walk her home.

6. Fatigue, injury "physically can't walk" keep her from walking

Motivation – "eventually have to leave the house to accomplish things" and weather are easy to overcome and walk to the university.

7. Time, (running late/not enough time to walk to school), how many trips has he made to campus, more than 1 trip may keep him from walking to school.

Having another way to transport, "just easier to walk" than anything else.

8. He lives 2 blocks away from campus so he feels that the distance has a huge effect on barriers to walking to school i.e. he is not far enough away to consider barriers. If he needs to get to school he will no matter what, and he will walk because he is so close. When he isn't motivated it is not the walking that demotivates him, it's just getting out of the house/going into school. Leg injury demotivates due to pain.

Snow and rain are easy to deal with (unless really precipitating heavily)

9. Below -20 (feels like/windchill) stops her from walking. Rain stops her because there is no shelter from field house to campus. Running late (not enough time to walk to school) stops her from walking.

Wind and heat probably should stop her she says, but they don't (easy to deal with).

Summary
Weather, extreme heat and extreme cold.
Time – running late/not enough time to walk to school

APPENDIX M. HIGHER AND LOWER CHALLENGE VIGNETTES – Final Version

Higher Challenge Vignette

Instructions: Please read the following story carefully. Focus only on this story and the experiences presented[3]. You may have already experienced situations like those described in the story. Please consider yourself in this situation as you read through the story.

John is a student at the University of Saskatchewan. He was born in Ontario but has lived in Saskatchewan for most of his life. After he graduates, he plans to get a full time job in the city. John has been active, off and on, for most of his life playing recreational sports and doing other outdoor physical activities with friends or on his own.

Ever since John has been going to the U of S, he has lived close enough to campus that he could walk[4]. It usually takes him between 15 and 20 minutes to walk one way. He enjoys walking to campus and usually looks forward to walking, especially when the weather is nice. John believes that walking will make him healthier, save him money on gas and other transportation costs, like car repairs and parking, and reduce his carbon footprint (meaning less carbon emissions because of his walking for travel).

During a typical week of school, John thinks about what he will need with him on campus for the day and then walks to his first class. He stays on campus for the rest of the day, going to classes, doing homework, and visiting with his friends. After his last class, he walks home. Although John walks regularly to campus, he believes it will be especially hard to do so in the upcoming week – it will be the middle of November already.

He has lots going on outside of what he normally does, which will make walking especially challenging. He has made a lot of other commitments this week; everything seems to have piled up in this one week. He is going to keep these other commitments, as he is not one to back out. For example, he promised to get together with friends for a couple of different birthday parties, he volunteers weekly, he also has to go to a dinner fundraiser, and then his family is coming to visit for a couple of nights. Having so many commitments will make it tougher for him to fit in time to walk to/from campus. To top it off, he has less motivation to walk to campus because he is pressed for time[5]. He also knows that he will have a few other ways to get to campus that would be quicker - making it more tempting to do. He knows that he could drive, take the bus, or catch a ride with a friend. In fact, his friend already offered to pick him up on the way to campus.

Thinking about a typical week in the middle of November, John remembers from his own experiences that the nights are getting cool but usually the temperature is quite nice when he walks, especially compared to the temperatures he knows winter is about to bring. However, this week is not typical. It is going to get very cold and it will be snowing for most of the week. It seems that winter might be coming early this year. This caught him off guard, as his winter

[3] All underlined passages indicate additions to the vignette from the vignette developed in the Pilot phase 1.
[4] Deleted "there"
[5] Order of this sentence changed.

clothing is still in the back of his closet. He was hoping that the cold temperatures and heavier snowfall would come later in the winter, at least into late December or into the new year.[6]

Thinking[7] about all of his plans[8] that will cut into his time, the fact that he could get to campus another way, and the bad weather that is coming, he feels really unmotivated to walk to and from campus.

Lower Challenge Vignette

Instructions: Please read the following story carefully. Focus only on this story and the experiences presented. You may have already experienced situations like those described in the story. Please consider yourself in this situation as you read through the story.

Chris is a student at the University of Saskatchewan. He was born in Ontario but has lived in Saskatchewan for most of his life. After he graduates, he plans to get a full time job in the city. Chris has been active, off and on, for most of his life playing recreational sports and doing other outdoor physical activities with friends or on his own.

Ever since Chris has been going to the U of S, he has lived close enough to campus that he could walk. It usually takes him between 15 and 20 minutes to walk one way. He enjoys walking to campus and usually looks forward to walking, especially when the weather is nice. Chris believes that walking will make him healthier, save him money on gas and other transportation costs, like car repairs and parking, and reduce his carbon footprint (meaning less carbon emissions because of his walking for travel).

During a typical week of school, Chris thinks about what he will need with him on campus for the day and then walks to his first class. He stays on campus for the rest of the day, going to classes, doing homework, and visiting with his friends. After his last class, he walks home. In the upcoming week, Chris believes that there will be a small challenge to walking to campus, though nothing really drastically out of the norm for other weeks when he walks.

Currently, it is the middle of November and he can't believe how fast the term is flying by. He thinks ahead to the next week of school and about whether he can keep walking regularly. He is happy - though life is still busy, it is a lot less crammed with things to do and he knows he can still walk and do other things he enjoys[9]. However, he has a few things to do outside of school - though it's not much different from any other weeks in the term. He is happy that his midterms are over and he only has a handful of quizzes before he has to start studying for finals[10]. It seems

[6] Replaced "Although he has spent most of his life in the province, he just cannot seem to get used to the cold weather and snow, especially when it comes earlier than expected. He keeps thinking that it is still only the fall and he has to face the cold and snow already."
[7] Deleted "now"
[8] Deleted "other"
[9] Replaced "because even though a few things seem like they will come up that may make it a bit harder than usual to walk, he knows he can still do it."
[10] Replaced "he finally won't have any exams or quizzes in the week – it's nice to have a break from cramming for them until the next round hits."

like every year at this time of the term he gets a nice break from the usual demands of midterms and finals. He knows that he will have more time to hang out with his friends and just relax a bit more than usual. He knows that he can also get caught up on his laundry and other stuff like that.

Chris decides to check the weather for the week. He thinks back to previous years. A typical week in the middle of November, from his own experiences, is when nights are getting[11] cool but usually the temperature is quite nice when he walks, especially compared to the temperatures he knows winter is about to bring. However, the snow this week is not very typical. It will likely be snowing for most of the week. Although not unreasonable to see snow like this in January, it caught him off guard as it is not normal to see this much snow in mid-November. This makes Chris feel like he won't be quite as motivated to walk as other weeks.

12

[11] Deleted "beginning to"

[12] Deleted "Even though John thinks he may be less motivated to walk because of the snow, he still has the desire to keep walking regularly to and back home from campus."

APPENDIX N. DEMOGRAPHIC SURVEY - Experiment

1) Are you currently a student at the University of Saskatchewan (U of S)?

☐ No
☐ Yes

2) What is your <u>current</u> student status?

☐ 1st year undergraduate student
☐ 2nd year undergraduate student
☐ 3rd year undergraduate student
☐ 4th year undergraduate student
☐ 5th year or above undergraduate student
☐ Masters graduate student or equivalent degree
☐ PhD graduate student or equivalent degree

3) What College are you in? Check all that apply.

☐ Arts & Science
☐ Commerce
☐ Agriculture
☐ Law
☐ Medicine
☐ Engineering
☐ Kinesiology
☐ Unclassified Studies
☐ Graduate Studies

4) Are you registered as a full-time student or a part-time student?

☐ Full-time student: 12 or more hours of class in the term
☐ Part-time student: Less than 12 hours of class in the term

5) Do you live in Voyager Place (that is one of the following: Saskatchewan Hall, Athabasca Hall, Qu'Appelle Hall or Qu'Appelle Extension)?

☐ No
☐ Yes

6) What is your employment status?

☐ Employed full-time: 40 or more hours in a week
☐ Employed part-time: Less than 40 hours in a week
☐ Not employed

8) What is your height without your shoes on?

Feet_____ Inches_____
or
Centimeters_____

9) What is your weight without your shoes on?

Pounds_____
or
Kilograms_____

10) Regardless of your nationality, which of the following would you use to best describe your ancestry (check ✓ all that apply)?

- ☐ White
- ☐ Chinese
- ☐ Black
- ☐ Filipino
- ☐ Latin American
- ☐ Southeast Asian
- ☐ South Asian
- ☐ West Asian
- ☐ North American Indian, Metis, or Inuit
- ☐ Arab
- ☐ Other

Please explain what is your other ancestry._____

11) What is your marital status?

- ☐ Married
- ☐ Divorced
- ☐ Widowed
- ☐ Single
- ☐ Not married, but living with a partner

12) What is the approximate range of your household TOTAL INCOME from ALL SOURCES?

- ☐$0-9,999
- ☐$10,000-19,999
- ☐$20,000-29,999
- ☐$30,000-39,999
- ☐$40,000-49,999
- ☐$50,000-59,999
- ☐$60,000-69,999

☐$70,000-79,999
☐$80,000 or more

13) What is your postal code?

Postal Code: _____

13) How far do you live from the U of S campus?

Kilometres _____
or
Miles _____

Part 2

Walking for active transportation means that you transport yourself to the University of Saskatchewan by walking. This is different than lesurely walking, which usually starts and ends in the same location.

The following questions will ask only about walking for active transportation to/from the University of Saskatchewan (U of S) campus.

14) Have you walked to/ from the U of S campus in the past 2 months (8 weeks)?

☐ No
☐ Yes – If yes, please provide the information below. Answer in whole numbers such as 1, 2, 3, etc.

In the past 2 months (8 weeks):
a) How **many times, in total**, did you walk **FROM HOME TO CAMPUS** **in a typical week**: _____

b) How **many times, in total**, did you walk **FROM CAMPUS TO HOME** **in a typical week**: _____

15) Do you plan to walk to/from the U of S campus over the next month (4 weeks)?

☐ No
☐ Yes – If yes, please provide the information below. Answer in whole numbers such as 1, 2, 3, etc.

In the next month (4 weeks):
a) How **many times do you plan** on walking **FROM HOME TO CAMPUS** **in a typical week**: _____

b) How **many times do you plan** on walking **FROM CAMPUS TO HOME <u>in a typical week</u>**: _____

16) Check all of the ways that YOU can realistically get <u>to/from</u> the U of S campus in a typical week? This doesn't mean that you actually use these ways, but you would have an option to if you wanted.

☐ Walk
☐ Drive my car
☐ Catch a ride with friends/carpool
☐ Take a bus
☐ Bike
☐ Roller blade
☐ Skateboard
☐ Other: please explain by what other way you can get to the U of S campus?
_____

17) Please check which of the following that best describes your walking <u>to/from</u> campus in a typical week.

☐ <u>Walking</u> is the <u>only way</u> you can get to/from campus
☐ You <u>sometimes</u> have an option to get to/from campus by another way, other than walking (e.g., bus, drive, bike, etc.)
☐ You <u>always</u> have an option to get to/from campus by another way, other than walking (e.g., bus, drive, bike, etc.)

18) How long have you been walking to the U of S campus? Add up all of the weeks that you walked to/from the U of S at least once during a week?

☐ Less than 6 months
☐ 6 months to 1 year
☐ Over 1 year and up to 2 years
☐ Over 2 years and up to 3 years
☐ Over 3 years and up to 4 years
☐ Over 4 years

19) Do you walk, on average, 3 days per week to the University? Some weeks you may walk 5 days, other weeks you may only walk once, but, your average is at least 3 days per week

☐ Yes
☐ No

20) Think about the reasons why you walk to/from the U of S campus. What are your 3 most important reasons?

☐ You get health benefits
☐ Reduces your carbon footprint (go green)
☐ Saves you money (e.g., gas, parking permits)
☐ You enjoy walking
☐ You can socialize with others while walking
☐ Relaxation you get from walking
☐ Other reason 1: please explain here: _____
☐ Other reason 2: please explain here: _____

21) Active transportation can involve other types of transportation, powered by you, to get to/from somewhere. Please check all types of transportation methods that you use in a usual week.

☐ Biking
☐ Roller blading
☐ Skate boarding
☐ Long boarding
☐ Other, please explain what other mode of active transportation that you use during a usual week: _____

22) Do you walk for active transportation to/from places other than the U of S campus?

☐ Stores/shops
☐ Meet friends at their homes
☐ Meet friends at a shop to socialize, like a restaurant, coffee shop, or bar
☐ Church
☐ Work (not on campus)
☐ Fitness facility (not on campus)
☐ Parks or outdoor recreational facilities
☐ Other: Where else do you walk to/from for active transportation.

_____

5) Think about the last 2 months. Rate how difficult it was for you to walk to/from the U of S campus?

1	2	3	4	5	6	7
Extremely difficult	Very difficult	A little difficult	Neither difficult or easy	A little easy	Very easy	Extremely easy

5b) Did you consider walking to the U of S campus a challenge over the past 2 months?

1	2	3	4	5	6	7	8	9

Not at all challenging								Extremely challenging

Exercise History – not including walking to/from the U of S campus

The following questions will ask you about your exercise. When answering, please **do not include your walking to/from the U of S campus** as part of your reported exercise.

Durig a typical 7-day period (a week), how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free time (write on each line the appropriate number).

Times per week

1) Strenuous exercise (heart beats rapidly) _____
(e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)

2) Moderate exercise (not exhausting) _____
(e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

3) Mild exercise (minimal effort) _____
(e.g., archery, fishing from a river bank, bowling, horseshoes, golf, snowmobiling, easy walking, bocce-ball)

During a typical 7-day period (a week), in your leisure time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)? **(check ✓ one)**

- ☐ Often
- ☐ Sometimes
- ☐ Never/Rarely

We would like you to answer these same questions again. But, this time, please **include your walking to/from the U of S campus** as part of your reported exercise.

During a typical 7-day period (a week), how many times on the average do you do the following kinds of exercise for more than 15 minutes during your free time (write on each line the appropriate number).

Times per week

1) Strenuous exercise (heart beats rapidly) _____
(e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)

2) Moderate exercise (not exhausting) _____
(e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

3) Mild exercise (minimal effort) _____
(e.g., archery, fishing from a river bank, bowling, horseshoes, golf, snowmobiling, easy walking, bocce-ball)

During a typical 7-day period (a week), in your leisure time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)? **(check ✓ one)**

- ☐ Often
- ☐ Sometimes
- ☐ Never/Rarely

APPENDIX O. PERSISTENCE MEASURES: NUBMER OF SOLUTIONS AND ANTICIPATORY PERSEVERANCE

Number of Solutions Worksheet

Please think about the barriers in the story that you just read. We would like you to write down as many solutions to cope with these barriers to walking to/from the U of S campus. Coping solutions do not have to be limited to ones that only you would use, but all suggested solutions should be realistic. Please list 1 coping solution only per answer and be as specific as possible.

Solution 1:

Solution 2:

Solution 3:

Solution 4:

Solution 5:

Solution 6:

Solution 7:

If you have additional solutions, let the research know and they will give you more paper.
Extra coping solutions:
Solution 8:

Solution 9:

Solution 10:

Solution 11:

Solution 12:

Solution 13:

Solution 14:

Solution 15:

Solution 16:

Anticipatory Perseverance

Think of the barriers to walking in the story you just read and the solutions you proposed. If you encountered these barriers in the next 7 days, what would your perseverance/ determination be for walking to the U of S campus? Circle one answer.

1. If you encountered the barriers in the story over the next 7 days, how much time are you willing to put forth in order to pursue walking to/from the U of S?

0	1	2	3	4	5	6	7	8	9	10

No time — **Will spend a moderate amount of time** — **Will spend as much time as it takes**

2. If you encountered the barriers in the story over the next 7 days, how much effort are you willing to put forth in order to pursue walking to/from the U of S?

0	1	2	3	4	5	6	7	8	9	10

No effort — **Will put forth a moderate amount of effort** — **Will put forth as much effort as it takes**

3. If you encountered the barriers from the story over the next 7 days, how willing are you to persist with your coping solutions towards the pursuit of walking to/from the U of S?

0	1	2	3	4	5	6	7	8	9	10

Will not persist at all — **Will persist moderately** — **Will persist as long as it takes**

4. If you encountered the barriers from the story over the next 7 days, how much of your attention can you direct towards applying your solutions so you can walk to/from the U of S?

0	1	2	3	4	5	6	7	8	9	10

No attention — **A moderate amount of attention** — **As much attention as needed**

APPENDIX P. EXPERIMENT RECRUITMENT MATERIAL

In-class Recruitment Flyer

Participants Needed for a Study on Walking to the U of S Campus

We are doing a study on walking to/from the U of S campus. We are interested in people who can tell us about their barriers walking to/back home from campus, are interested in reading a description about barriers, and/or filling out some surveys on these topics.

To participate, we are looking for:

- Undergraduate or graduate students at the University of Saskatchewan
- Have walked to or from campus in the past 2 months
- Have future plans to walk to or from campus
- Can't live in Voyageur Place (i.e. Saskatchewan Hall, Athabasca Hall, Qu'Appelle Hall and Addition)

Please sign your name at the bottom of the sheet if you are interested in volunteering for our study

Why is this study important?

This study is important to help us understand the barriers that students may have to walking for active transportation to campus. It will also help us understand some reasons why some people may be better able to deal with barriers than others.

What do you have to do to participate?

You are not required to participate in this study. There will be no negative consequences for you if you choose not to participate. There will be no compensation or benefits for your participation.

However, if this study is of interest to you, check the box and fill out the information below. Then, Mike (graduate student researcher) will then contact you to participate in a two-part study. Part one will be a link to an online survey that shouldn't take you more than 30 minutes to complete. Then, you will be asked to come into our lab on the U of S campus and fill out a paper survey that shouldn't take more than 45 minutes to complete.

If you are interested please begin the survey by following the link below:

https://survey.usask.ca/survey.php?sid=27003

If you have any questions please contact:
Graduate student researcher: Michael Secora: **walk2school.survey@usask.ca**

Online Bulletin-board Flyer

Participants Needed for a Study on Walking to the U of S Campus

To participate

- Undergraduate or graduate students at the U of S

- Walked to or from campus in the past 2 months

- Plans to walk to or from campus

- Can't live in Voyageur Place

Importance

This study is important to help us understand the barriers that students may have to walking for active transportation to campus.

Participation

You are not required to participate in this study and there will be no consequences for you if you choose not to participate. There will not be any compensation or benefits for participating.

This is a two part-part study. Part one will be a link to an online survey that shouldn't take you more than 30 minutes to complete. Then, you will be asked to come into our lab on the U of S campus and fill out a paper survey that shouldn't take more than 45 minutes to complete.

If this study is of interest to you, please follow the link below.

https://survey.usask.ca/survey.php?sid=27003

Ethics approved on March 28, 2011: Beh 11-52

For more information, contact
Michael Secora Walk2school.survey@usask.ca

Recruitment Poster

Participants Needed for a Study on Walking to the U of S Campus

Please take a tab at the bottom of the sheet if you are interested in participating in the study

We are interested in finding out about walking to/from the U of S campus. We are interested in people who can tell us their barriers to walking for active transportation, are interested in reading a description about barriers, and/or filling out some surveys on these topics.

To participate, we are looking for:

- Undergraduate or graduate students at the University of Saskatchewan
- Have walked to or back home from campus in the past 2 months
- Have future plans to walk to or from campus
- Can't live in Voyageur Place (i.e. Saskatchewan Hall, Athabasca Hall, Qu'Appelle Hall and Addition)

Why is this study important?

This study is important to help us understand the barriers that students may have to walking for active transportation to campus. It will also help us understand some reasons why some people may be better able to deal with barriers than others.

What do you have to do to participate?

You are not required to participate in this study. There will be no consequences for you if you choose not to participate. There will be no compensation or benefits for your participation.

This is a 2-part study. Following the link provided for you on the tab will take you to an online survey that shouldn't take you more than 30 minutes to complete. Then, on a separate occasion you will be asked to come into our lab on the U of S campus and fill out a paper survey that shouldn't take more than 45 minutes to complete. If you have any questions please email **Michael Secora: walk2school.survey@usask.ca**

Michael Secora
Walk2school.survey.usask.ca
https://survey.usask.ca/survey.php?sid=2
7003
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Michael Secora
Walk2school.survey.usask.ca
https://survey.usask.ca/survey.php?sid=2
7003

Thumbnail Recruitment Flyer

2-Part Survey on Walking to the University

Part 1: online, should take no longer than 30 minutes to complete
https://survey.usask.ca/survey.php?sid=27003
Part 2: paper survey at the Physical Activity Complex
Michael Secora
Walk2school.survey.usask.ca

Email Recruitment Message

Hello,

My name is Mike Secora. I am recruiting students who walk to/from the U of S campus for a survey on barriers that keep people from walking.

A bit about my study:
We are examining ways students overcome barriers that keep them from walking to the U of S campus and may help us understand why some people are better at dealing with barriers to walking than others. This survey is a two-part survey. Part 1 is an online survey that has taken on average 15 minutes to complete but will take no more than 30 minutes to complete. The second survey is a paper survey to be completed at the Physical Activity Complex at a time of their choosing and will take no more than 45 minutes to complete. The appointment time of the second in-person survey will be set up via email contact between the experimenter and each participant after completion of the first online survey.

If you would like to participate in the survey, follow the link below. If you have any questions, please contact me, my email is at the bottom.

Link: https://survey.usask.ca/survey.php?sid=27003

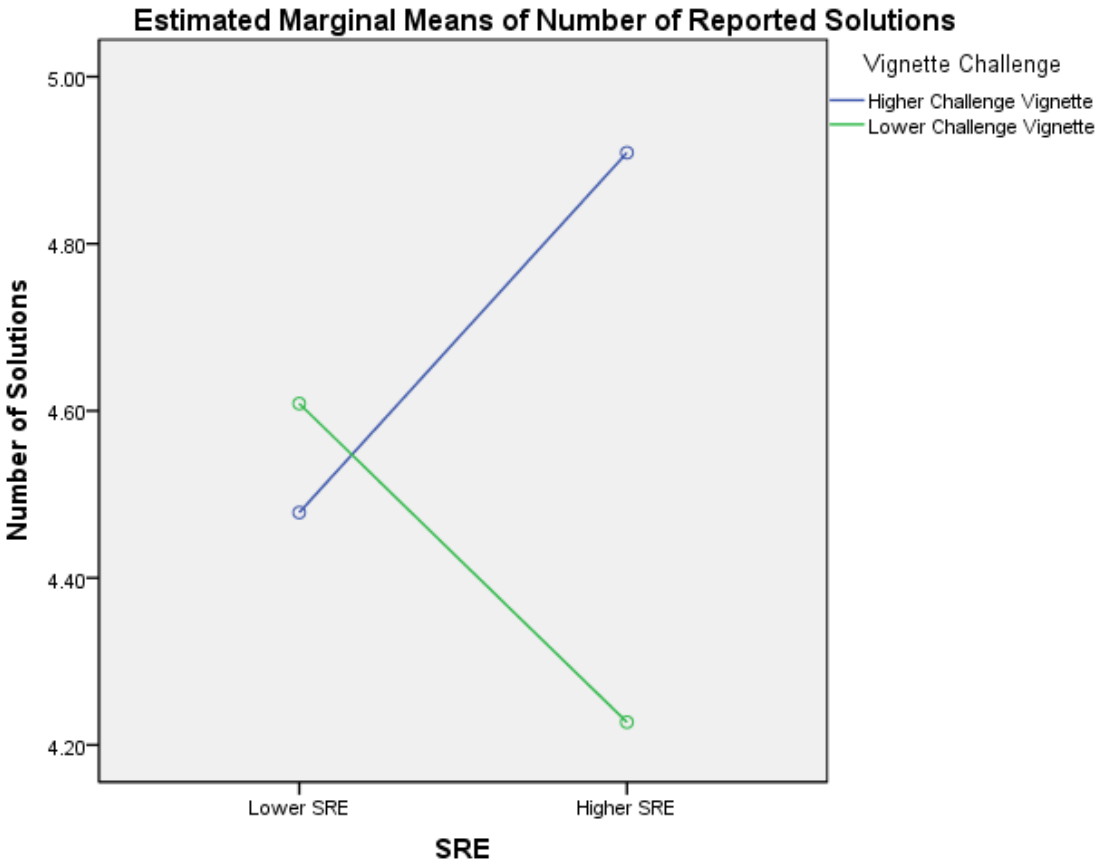
Thanks for your time,

Michael Secora, Masters candidate, College of Kinesiology
Walk2school.survey@usask.ca
Supervisor: Dr. Nancy Gyurcsik
University of Saskatchewan

APPENDIX Q. EXAMPLES OF COPING SOLUTIONS

1. Rearrange schedule.
2. Go to bed earlier so you are refreshed in the morning and motivated to walk.
3. Get your winter clothing out and make sure it is accessible in the morning so you can face the cold temperatures.
4. Commit to walk x # of times per week.
5. Buy new sweet outdoor clothing to show off walking to school ☺
6. Encourage your friend to drive over, then walk together from John's.
7. Look at the time spent walking as her own personal time to think/relax (listen to music etc.)
8. Makes plans to meet up w/ friends on campus.
9. Set a goal to walk at least a few [times] that week regardless of [commitments].
10. Obtain a locker at school to keep most of his supplies in. Less weight in back pack.

APPENDIX R. EXTIMATED MARGINAL MEANS OF NUMBER OF REPORTED SOLUTIONS



APPENDIX S. ESTIMATED MARGINAL MEANS OF ANTICIPATORY PERSEVERANCE